



# Clean Bay Strategy

**SOUTH BAY WATERSHED ACTIVITIES**

**STATUS REPORT**

**JANUARY 2003**

SAN JOSE/SANTA CLARA  
WATER POLLUTION  
CONTROL PLANT

**Administered by the Environmental Services Department, City of San José**

**TRIBUTARY AGENCIES:**

Cities of: San José, Santa Clara and Milpitas • Cupertino Sanitary District  
West Valley Sanitary District —including Campbell, Los Gatos, Monte Sereno and Saratoga  
County Sanitation Districts 2-3 • Sunol and Burbank Sanitary Districts



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## **APPENDIX A**

CLEAN BAY STRATEGY TIMELINE

# ABBREVIATIONS AND UNITS OF MEASURE

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<i>Action Plan</i>	<i>Revised South Bay Action Plan</i>
ADWEF	Average Dry Weather Effluent Flow
BACWA	Bay Area Clean Water Agency
BAPPG	Bay Area Pollution Prevention Group
BASMAA	Bay Area Stormwater Management Agencies Association
Bay	San Francisco Bay
BMM	Watershed Management Initiative Bay Monitoring and Modeling Subgroup
BMP	Best Management Practice
CBS	Clean Bay Strategy
CEP	Clean Estuary Partnership
City	City of San José
ERP	Enforcement Response Plan
ESD	Environmental Services Department
FAS	Flow Audit Study
FY	Fiscal Year
GW	Groundwater Infiltration
Industrial	Industrial Water Recycling and Reuse
IPM	Integrated Pest Management
IPM Project	<i>Our Water Our World</i> Partnership
IU	Industrial User
NIPP	Nickel Initiative Partnership Program
NPDES	National Pollutant Discharge Elimination System
PBCE	Department of Plumbing, Building, and Code Enforcement
Plant	San Jose/Santa Clara Water Pollution Control Plant
PMC	Pesticide Management Committee
POTW	Publicly Owned Treatment Works
Regional Board	California Regional Water Quality Control Board, San Francisco Bay Region
RFP	Request for Proposal
RMP	Regional Monitoring Program
SBWR	South Bay Water Recycling
SFEI	San Francisco Estuary Institute
South Bay	San Francisco Bay, South of Dumbarton Bridge
TAG	Technical Advisory Group
TMDL	Total Maximum Daily Load
Tributary Agencies	Cities and Agencies Tributary to the Plant: San José; Santa Clara; Milpitas; Cupertino Sanitary District; West Valley Sanitary District – Campbell, Los Gatos, Monte Sereno, and Saratoga; County Sanitation Districts 2 and 3, and Sunol and Burbank Sanitary Districts

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## **ABBREVIATIONS AND UNITS OF MEASURE**

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TWG	TMDL Work Group
ULFT	Ultra-Low Flush Toilet
Urban Runoff Program	Santa Clara Valley Urban Runoff Pollution Prevention Program
U.S. EPA	United States Environmental Protection Agency
Water District	Santa Clara Valley Water District
WE&O	Watershed Education and Outreach
WEP	Water Efficiency Program
WET	Water Efficient Technologies
WMI	Santa Clara Basin Watershed Management Initiative

### **UNITS OF MEASURE**

ccf	hundred cubic feet
gpd	gallons per day
LF	linear feet
mgd	million gallons per day
ppb	parts per billion
ppd	pounds per day (lbs/day)
ppt	parts per trillion





# INTRODUCTION

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The City of San Jose (City) manages the San José/Santa Clara Water Pollution Control Plant (Plant) for the Cities of San José, Santa Clara, Milpitas, Cupertino Sanitation Districts 2-3, Sunol and Burbank Sanitary Districts and West Valley Sanitation District (Campbell, Los Gatos, Monte Sereno, and Saratoga). The Plant is located at the southern end of one of the most important estuaries in the United States and receives discharge from over 1.4 million residents and more than 16,000 commercial and industrial facilities, including the leading companies of Silicon Valley. The City faces numerous environmental issues relating to the Plant's discharge flows, including water quality and habitat issues. The current NPDES permit governing the Plant's wastewater discharge is due to expire in June 2003. All of the cities that discharge to the Bay, including San Jose, Santa Clara, and representatives for the tributary agencies, are currently participating in a stakeholder process to renew the permits for the three South Bay treatment plants.

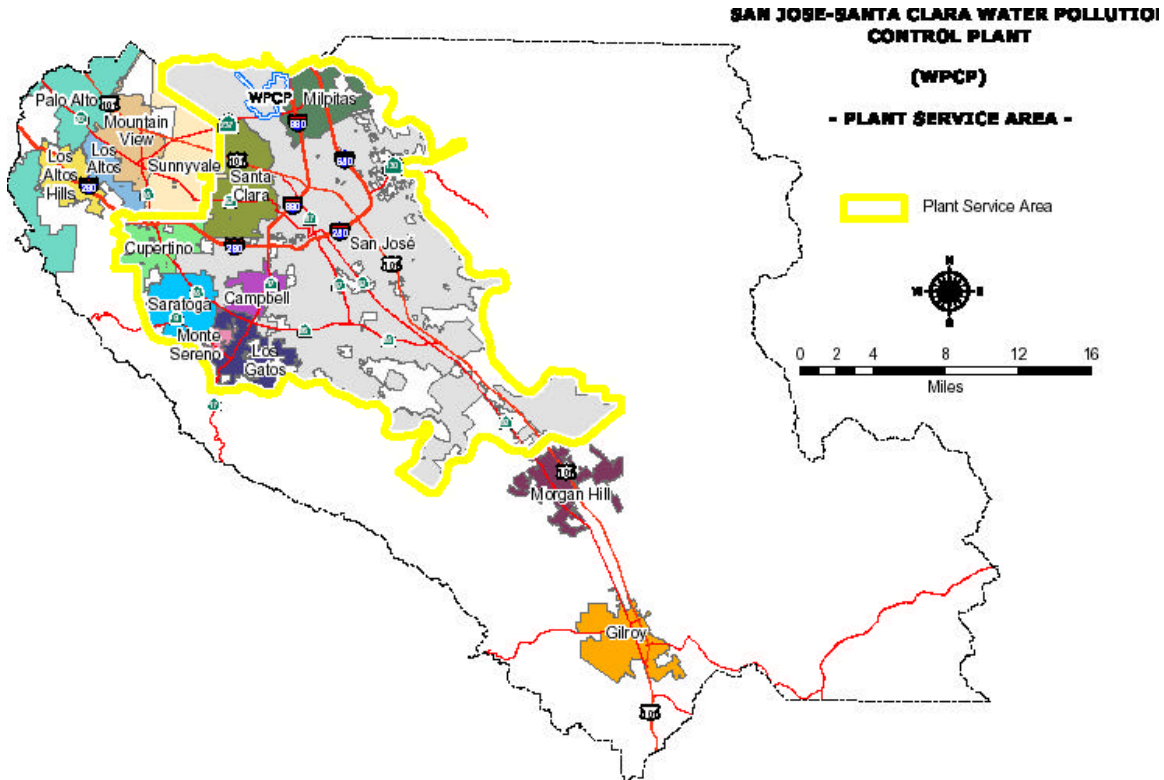
This report provides an update on the activities for the fulfillment of the Plant's NPDES discharge permit during the period July 1, 2002 to December 31, 2002, as well as a summary of efforts during the permit cycle from 1998 to 2002 under Permit Order 98-052, amendments 01-108 and 01-109. The

report includes pollutant priorities, sources of pollutants, pollution prevention progress, and plans for the next year. For this permit cycle, priority pollutants and issues were:

- Copper and Nickel (Chapter 1)
- Flow and Habitat Protection (Chapter 2)
- Mercury (Chapter 3)
- Pesticides and Persistent Bioaccumulative Toxins (Chapter 4)

In addition, the City is implementing other related watershed activities as described in Chapter 5.

The Tributary Area discharging to the Plant is shown on the next page.



## THE CITY'S NPDES STRATEGY

Since 1994, the City has managed the Plant's pollution prevention program using the Clean Bay Strategy (CBS), which defined the policies and principles of watershed management from the City/Plant's perspective and served as the basis for prioritizing programs. The current permit strategy builds upon and expands the successful CBS approach, while preserving the following basic goals and principles:

- Holistic approach to environmental protection
- Regulatory certainty for the City and industrial dischargers
- Sound science and data collection

- Environmental Equity
- Stakeholder involvement and education
- Cost-effective environmental protection.

Some of the goals for the next five-year permit cycle are:

- Compliance with permit requirements
- Comprehensive, cost-effective protection of the South San Francisco Bay through environmental leadership
- To protect beneficial uses
- To focus on an ecosystem approach
- Ongoing assessment of programmatic data to ensure continuous improvement
- Coordination and integration with local and regional programs and restoration efforts

- To obtain stakeholder support

The City believes that a watershed management program must integrate POTW and urban stormwater programs with land use and transportation planning, into a comprehensive plan to identify the most cost-effective and environmentally beneficial programs. Central to this watershed approach is the acknowledgement of benefits that can be provided by the Plant's effluent, including recycled water uses and habitat improvements. The City supports environmental and regulatory programs that produce a net environmental benefit for the ecosystem, while maintaining regulatory compliance.

The City supports U.S. EPA in its effort to "restructure the permits program and seek changes in the water quality standards, TMDL, and enforcement programs to promote planning, development, and implementation of environmental programs on a watershed basis."<sup>1</sup> The goal is to have current and future NPDES programs that are based on U.S. EPA's recent Watershed-Based NPDES Permitting Policy Statement which says, "A holistic watershed management approach provides a framework for addressing all stressors within a hydrologically defined drainage basin instead of viewing individual sources in isolation."<sup>2</sup>

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<sup>1</sup> *Protecting the Nation's Waters through effective NPDES Permits*, EPA, June 2001

<sup>2</sup> EPA Watershed-Based NPDES Permitting Policy Statement Memorandum from G. Tracy Mehan, III to Water Division Directors, Regions I-X. January 07, 2003.

## ACCOMPLISHMENTS DURING THE 1998-2003 PERMIT CYCLE

Average Dry Weather Effluent flows<sup>3</sup> were maintained well below the 120 mgd trigger for five consecutive years.

The combined effort of all flow reduction programs over the past ten years has resulted, by the end of 2002, in a reduction of over 20 mgd of flow, 10 mgd of which came from South Bay Water Recycling. The 2002 ADWEF was 102 mgd.

To achieve the reductions, over 121,000 Ultra Low Flush Toilets (ULFTs) were installed, more than 17,000 h-axis washing machine rebates were given, 400 South Bay Water Recycling Customers were brought on-line using over 75 miles of pipeline, industrial flow reduction programs were implemented, and sewer retrofits reduced groundwater infiltration.

**Marsh conversion analysis** shows that salt marsh acreage has increased over the last 10 years. Since 1989, 180 acres of new salt marsh have formed. The City's studies indicate that various factors contribute to marsh changes and is continuing to monitor habitat in the vicinity of the discharge. In addition, the City plans to become an active partner in the restoration of Cargill salt ponds.

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<sup>3</sup> The lowest average effluent discharged during three consecutive months between May and October.



**Pollutant Reduction** through source control efforts has kept industrial copper and nickel loading levels to the Plant below 1997 baseline levels. The Plant has had sixteen minor violations of its permit limits during the five-year permit cycle. Nine of the violations were due to zinc concentration and mass loading. The increased levels of zinc were traced to the addition of zinc orthophosphate in potable water as a corrosion inhibitor. Mandatory minimum penalties were waived for these violations. No other penalties have been assessed. The Plant did not exceed any permit limits in 2002.

**Total Maximum Daily Load Study for copper and nickel:** The City funded a Total Maximum Daily Load study, including facilitation of a stakeholder forum. The study found that the Bay is unlikely to be impaired by copper and nickel and that site-specific objectives are appropriate. In May 2002, the Regional Board developed a Basin Plan amendment to incorporate copper and nickel site-specific objectives. Removing the South Bay from the impaired water body list addresses the Plant's permit compliance issues relating to copper and nickel. The City is now implementing the Copper and Nickel Action Plans developed in the stakeholder process.

**Strong science and increased data collection** will continue to be important in the development of indicators such as the City's bioassessment program to assess plankton community composition and conventional water chemistry to measure and mark progress. All special

studies required by the 1998 permit were completed with the exception of the bioassessment study. In November 2002, the City requested and received from the Regional Board a six-month time extension for deliverables associated with this study, with the final report on Phase I due to the Regional Board in June 2003 and a Phase II final report due in June 2005.

In addition, the City continues its trace level monitoring in South San Francisco Bay.

**Santa Clara Basin Watershed Management Initiative (WMI):** The WMI was established in 1996 by the U.S. EPA, the State Water Resources Control Board, and the Regional Board as a broad community-based stakeholder process focused on protecting and enhancing the Watershed by developing a watershed management plan for the Santa Clara Basin. The City has been a leader in this effort, which is currently completing a watershed assessment and developing an action plan and first year implementation workplan. Additional highlights since 1998 include the completion of the WMI vision and implementation objectives and State recognition in 2002, of the WMI as one of the ten best watershed efforts in the state.

**Regional Coordination:** The City is an active participant in regional pollution prevention activities, including participation in collaborative processes such as the Clean Estuaries Partnership (CEP), the Bay Area Pollution

Prevention Group (BAPPG), and the Bay Area Clean Water Agencies (BACWA).

**Outreach:** The City is a partner in the successful Watershed Watch campaign launched in September 2001 by the Santa Clara Valley Urban Runoff Pollution Prevention Program and the WMI. The City's strong outreach program has also contributed to its success in reducing flows to the Bay. The City participated in establishment of a Bay Area Wide Regional Phone line, and the regional media relations group. City staff chairs BAPPG and participated in Bay Area Stormwater Management Agencies Association's national award-winning regional ad campaign "When ants invade."

**Watershed Grants Program:** The City initiated a Watershed Grants Program to support community involvement in watershed activities. Since 1998, \$600,000 dollars for 36 grants were awarded.

**Plant Optimization:** During the permit cycle, the Plant fully implemented a Biological Nutrient Removal process, which enhanced the Plant's efficiency and reduced nutrient levels in the Plant's effluent. In 2000, the Plant was awarded U.S. EPA's National Operation and Maintenance Excellence Award for large treatment Plants. The Plant is also proceeding on the implementation of a wet weather reliability project that is scheduled for completion in 2006.

## NEXT STEPS

The City's NPDES permit approach is intended to be flexible and is evaluated annually, making improvements or changing priorities as new data and other information becomes available. The City is currently participating in a stakeholder process to reissue the South Bay treatment plant permits, which is scheduled for completion in June 2003.

The Plant and other Bay Area dischargers will face requirements for new pollutants of concern and we want to build on the successful copper and nickel approach to address common, regional issues. The City will continue to collect essential South Bay water quality impairment information and to characterize our discharge in light of current and future environmental concerns. This assessment and monitoring information will allow the City to make decisions based upon sound technical information that support cost-effective environmental programs along with sustained economic growth.

Based on regulatory requirements and monitoring information and research, program development will focus in the following areas:

- Maintain flow reduction gains by continuing programs and implementing funded projects for water recycling and groundwater infiltration reduction.
- Continue implementation of the copper and nickel action plans.

- Participate in a regional approach to mercury control.
- Participate in regional research to address cyanide.
- Participate in regional habitat improvement projects such as salt pond restoration.

*Clean Bay Strategy Reports*, as well as other studies and information related to South Bay Water Quality issues, may be found on the following website: <http://www.ci.san-jose.ca.us/esd/>.

Any questions about this report may be directed to the Environmental Services Department, Watershed Protection, at (408) 945-5121.



# CHAPTER 1

## COPPER AND NICKEL PROGRAM

In 1989, San Francisco Bay south of the Dumbarton Bridge (South Bay) was designated by the U.S. Environmental Protection Agency (U.S. EPA) as an impaired water body under Section 304(l) of the Clean Water Act due to anthropogenic inputs of seven metals, including copper and nickel. The three municipal treatment plants (San Jose/Santa Clara, Sunnyvale, and Palo Alto) and stormwater runoff were designated as sources contributing to the impairment. Until 2002, the South Bay had been continuously listed as an impaired water body under the State's 305(b) reporting requirement. Under the Clean Water Act, a Total Maximum Daily Load (TMDL) is required to be developed for impaired water bodies where point source controls are not sufficient to meet water quality objectives. Despite stringent limits on the three municipal treatment plants, water quality objectives for copper, nickel, and mercury were not being met in the South Bay according to Regional Monitoring Program monitoring of the South Bay.

In October 1994, the City developed a comprehensive Clean Bay Strategy in response to stringent copper, nickel and cyanide limits. In particular, the standard method of calculating local limits had resulted in a loading allocation for industry that would be

negative. Since this was not technically or economically feasible, the City developed a new methodology for calculating local limits and implemented a comprehensive pollution prevention plan that included successful programs such as the Nickel Initiative Partnership Program.

The City developed an effective pollution prevention program, improved the treatment process at the Plant, and funded extensive research and a Total Maximum Daily Load (TMDL) process to address these pollutants of concern.

### Goals of Copper and Nickel Pollution Prevention Program

- Protect beneficial uses of South Bay from copper and nickel
- Provide sound science to develop reasonable and protective permit limits for the municipal treatment plants by resolving 303(d) listing issues
- Use a watershed approach and focus on cost-effective solutions and priority sources of pollutants

### WATERSHED SOURCES

According to the Conceptual Model Report (Tetra Tech, December 1999), the two largest sources of total copper and nickel to the Lower South San

Francisco Bay are sediment exchange during resuspension and nonpoint source loads from tributaries.

## **SOURCE IDENTIFICATION**

From 1995 through 2001, trunkline and upstream monitoring was used to identify the sources of copper and nickel as well as other pollutants entering the Plant. Program data was used to identify trunklines where pollutant loading trended upward and the pattern which pollutants entered the Plant. Upstream monitoring was then used to further isolate pollutants sources.

Based on the program findings and the completion of the program's objectives, the trunkline and upstream monitoring program has concluded. A site-specific surveillance program will continue as part of the Pretreatment Program to identify non-compliant dischargers. Details of the six-year program were described in the July 2002 *CBS Report*.

## **TECHNICAL STUDIES**

### **Total Maximum Daily Load and Coordination with the Watershed Management Initiative**

The City believes that a TMDL is the technical basis for a watershed approach, because it provides a holistic view of a watershed by measuring the effect of each pollution source on the entire system.

The Santa Clara Basin Watershed Management Initiative (WMI) was initiated by the Regional Board in April 1996 to develop a watershed management

plan for the Santa Clara Basin. The WMI is being led by a group of representatives from 33 different agencies and organizations. To achieve the goal of the WMI, one of the key first steps identified by the core group was the need for a TMDL effort, recognizing that the TMDL effort will start with copper and nickel, but the approach used for copper and nickel should be useable for other pollutants or stressors. The Bay Monitoring and Modeling (BMM) subgroup was formed, in part, to define modeling needs for the South Bay and investigate regulatory tools to address compliance issues. The mission of the BMM subgroup is to "...establish a sound and technical basis for future regulatory decisions affecting the Lower South Bay."

As part of a provision in its 1998 permit and in partnership with the BMM's subgroup's process, the City funded technical studies in support of development of TMDLs for copper and nickel in the South Bay. Stakeholder involvement and coordination were a critical element of this effort.

The City developed a Request for Proposal (RFP) in the spring of 1997. Throughout the process of RFP development, consultant selection, and contract development, the City coordinated with stakeholders. Such coordination is unprecedented for the development of a City contract totaling over \$3.5 million over four years. The scope of work, developed after negotiation with the selected contractor Tetra Tech, was reviewed by the BMM subgroup members and regulatory



agency staff knowledgeable about TMDL development.

In 1998, the Copper and Nickel TMDL Work Group (TWG) was formed by the WMI to provide guidance for the development of the TMDLs for copper and nickel in Lower South San Francisco Bay. A broad group of stakeholders was represented on the TWG, including several environmental groups, local wastewater treatment plants, local public agencies responsible for the urban runoff program, state and federal regulators, industry and local business representatives, and national organizations such as the Copper Development Association.

One of the first actions of the TMDL stakeholder group was to recognize the TMDL effort as a decision-making process, rather than merely a collection of technical reports. The fundamental focus of the TMDL effort was to:

1. Conduct an Impairment Assessment to determine if ambient concentrations of copper and nickel were negatively impacting the designated Lower South San Francisco Bay beneficial uses;
2. Develop a range of scientifically defensible water quality objectives/standards for copper and nickel; and
3. Develop a conceptual model of copper and nickel cycling to evaluate attainment of the range of objectives/standards.

The purpose of the impairment assessment was to present new information and to re-evaluate the

determination that the beneficial uses of Lower South San Francisco Bay were impaired due to ambient concentrations of copper and nickel. The final results of the impairment assessment indicate that impairment to beneficial uses of Lower South San Francisco Bay due to ambient copper and nickel concentrations is unlikely. The TMDL workgroup then developed Action Plans to monitor copper and nickel, to ensure that levels of copper and nickel in the Bay are maintained and that actions would be taken if levels increased beyond certain triggers. In addition, the Action Plans address remaining uncertainties with respect to copper and nickel impairment issues which resulted in the City's bioassessment effort. The Action Plans were incorporated in the Plant's permit in October 2000. The copper and nickel action plans were developed, in concert with the Regional Board and other stakeholders, as a means to ensure that a Water Quality Attainment Strategy was in place for the South Bay.

As a result of the TMDL workgroup's efforts, the Regional Board approved a Basin Plan amendment that includes Site Specific Objectives for copper and nickel. The State Board approved delisting of the South Bay for copper and nickel from the 303D list.

The City also performed the following studies in support of development of Site Specific Objectives for copper and nickel. The research was peer-reviewed and accepted by regulatory agencies to develop the Site Specific Objectives included in the Basin Plan amendment:

- May 1998: South San Francisco Bay Copper Site-Specific Criterion Report.
- October 1998: Acute to Chronic Nickel Toxicity: Development of an Acute-to-chronic ratio for west coast marine species
- October 1998: South San Francisco Bay Nickel Site-specific Criterion Report

Based on these reports, site-specific chronic and acute water quality objectives for dissolved concentrations of copper and nickel in the South Bay were developed.

## POLLUTION PREVENTION PLAN

(COPPER ACTION PLAN Appendix A Baseline Number 13)

### Copper Action Plan

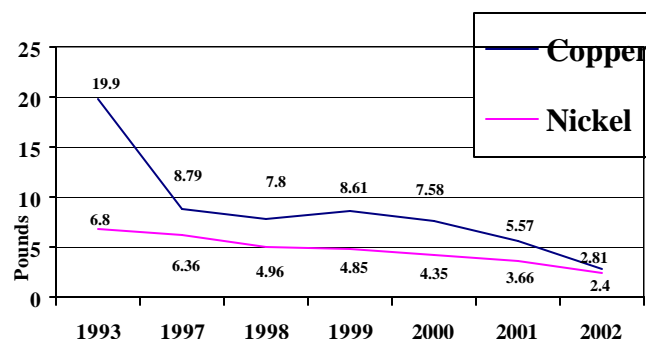
The City is implementing the Copper and Nickel Action Plans, which include baseline activities for the Plant and Urban Runoff Program. The City and other dischargers hold stakeholder meetings twice a year to review the status of the Copper and Nickel Action Plan activities.

The latest stakeholder meeting was held November 18, 2002. The following issues were discussed:

- The status of and future objectives for tracking and encouraging efforts to understand and help reduce uncertainty associated with the development of the copper and nickel site-specific objectives
- Enhance the current action plan reporting format

- Developing an environmental clearinghouse
- Update of the City bioassessment studies
- Coordinating with copper and nickel efforts planned for the North San Francisco Bay
- September 15, 2002 status report submitted for stormwater
- Update of the City's ambient receiving water monitoring.

**Figure 1: Total Permitted Industrial Copper and Nickel Loading to the Plant**



### The City's Pollution Prevention Program

The Pollution Prevention Program includes, or has included, Upstream Monitoring to identify sources of copper and nickel to the trunklines, as well as a site-specific surveillance program to identify spike dischargers. In addition, the Municipal Code was changed in 1994 to designate copper and nickel dischargers as Group 1 or 2 dischargers and require them to complete Mass Audit Studies or Reasonable Control Measure Plans to reduce copper, nickel and wastewater discharge. Total

permitted industrial loading of copper and nickel to the Plant have remained below 1997 baseline levels due to many factors including pollution prevention, production efficiencies, a sluggish economy and facility closures. See Figures 1 and 9 - 11.

The City has been a regional leader in implementing pollution prevention activities. The City's 1994-1997 Nickel Initiative Partnership Program (NIPP) formed a public/private partnership with the four largest dischargers of nickel to the Plant and through collaboration and research, succeeded in reducing nickel from these discharger's by more than 50% in spite of production increases. In addition, the City formed a partnership with four Printed Circuit Board Manufacturers, modeled on the successful NIPP and led by a former member, to reduce flow, copper and nickel loading from these industries. The City maintains ongoing communication and training for dischargers, including the Industrial User Academy and a periodic newsletter called the Tributary Tribune. Both the Academy and the Tributary Tribune cover pretreatment program and storm water requirements, compliance issues and pollution prevention topics specific to the Plant's service area.

The City is also very active in the BAPPG and BACWA regional pollution prevention and outreach development groups. Over the past five years these groups developed the following programs and materials addressing copper and nickel sources, as well as updated many existing materials.

- *Guidelines for Managing Water in Cooling Systems* – San José
- *BMP's for Educational Institutions* – San José
- *BMP's for Printing and Photoprocessing Operations* – San José
- *Wastewater Paths* poster – The City
- *Copper Plumbing and the Health of the Bay* – Guidelines for Plumbers – San José, Sunnyvale, and Palo Alto
- *Get to the Root of the Problem* root killer brochure – BAPPG
- Spanish Radio Outreach – BAPPG project managed by San José
- Bay area wide "Clean It" guide printing - BAPPG

## AMBIENT MONITORING

### Regional Monitoring Program

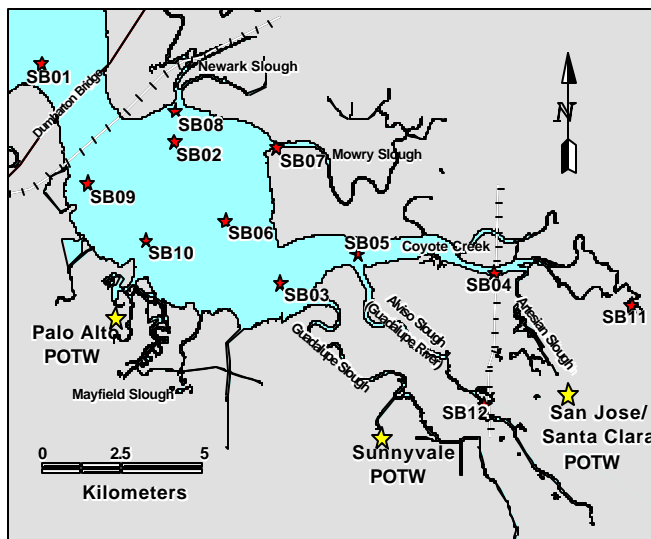
The City supports and actively participates in the Regional Monitoring Program (RMP), a region-wide assessment and monitoring program administered by the San Francisco Estuary Institute on behalf of the Regional Board. The City supports one additional sampling station in the southern end of the Bay.

### Ambient Monitoring

The City monitors various water quality parameters, including copper and nickel, monthly at 12 sampling sites in the extreme South Bay (see Figure 2). These sites represent deep channel, mid-channel, shallow mudflats, and areas of significant stream influence. This monitoring program provides fundamental information describing the spatial and temporal trends in water

quality. This monitoring information also represents the basis for trigger levels in the Copper and Nickel Action Plans and their associated pollution control activities.

**Figure 2: Ambient Monitoring Stations**



## PROGRAM EVALUATION

### Trends in Bay.

Over the duration of this permit cycle, levels of dissolved copper and nickel have remained consistent and no Action Plan trigger levels have been exceeded (see Figures 3 & 4).

For comparison, the influent and effluent concentrations of copper and nickel to the Plant over the five years of the NPDES permit cycle are shown in Figures 5 – 8.

Figure 3: Dry Weather Dissolved Copper Means for Indicator Stations

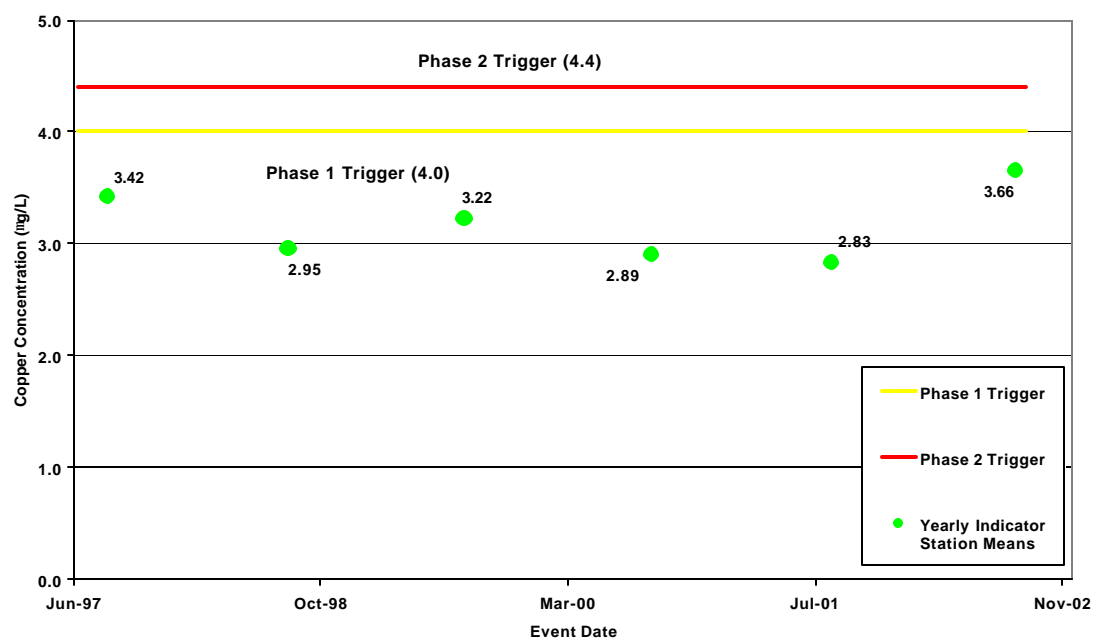


Figure 4: Dry Weather Dissolved Nickel Means for Indicator Stations

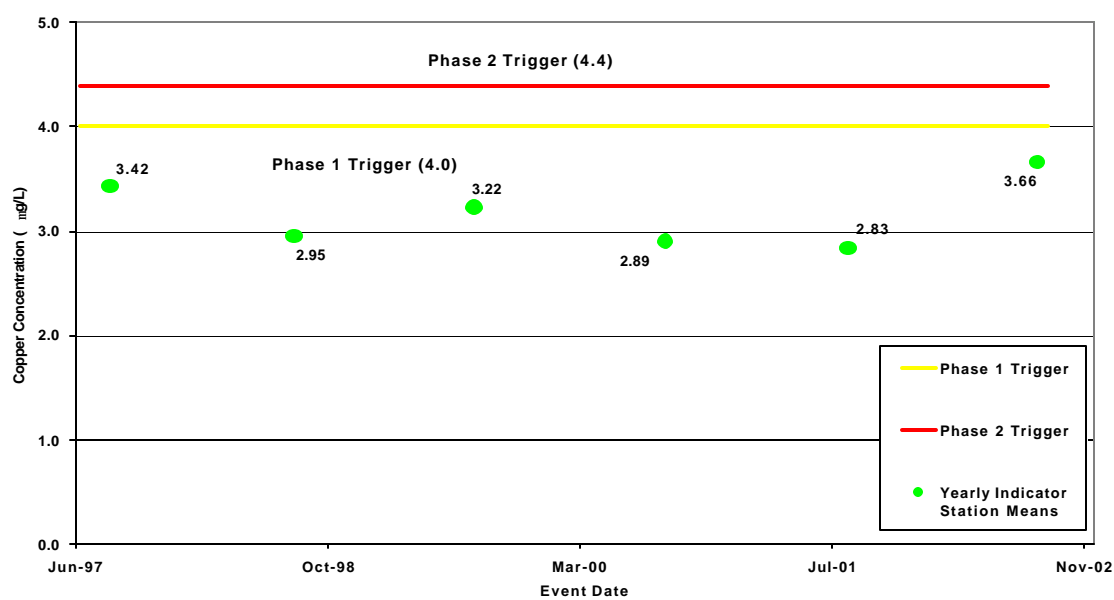




Figure 5: Influent Copper to the Plant

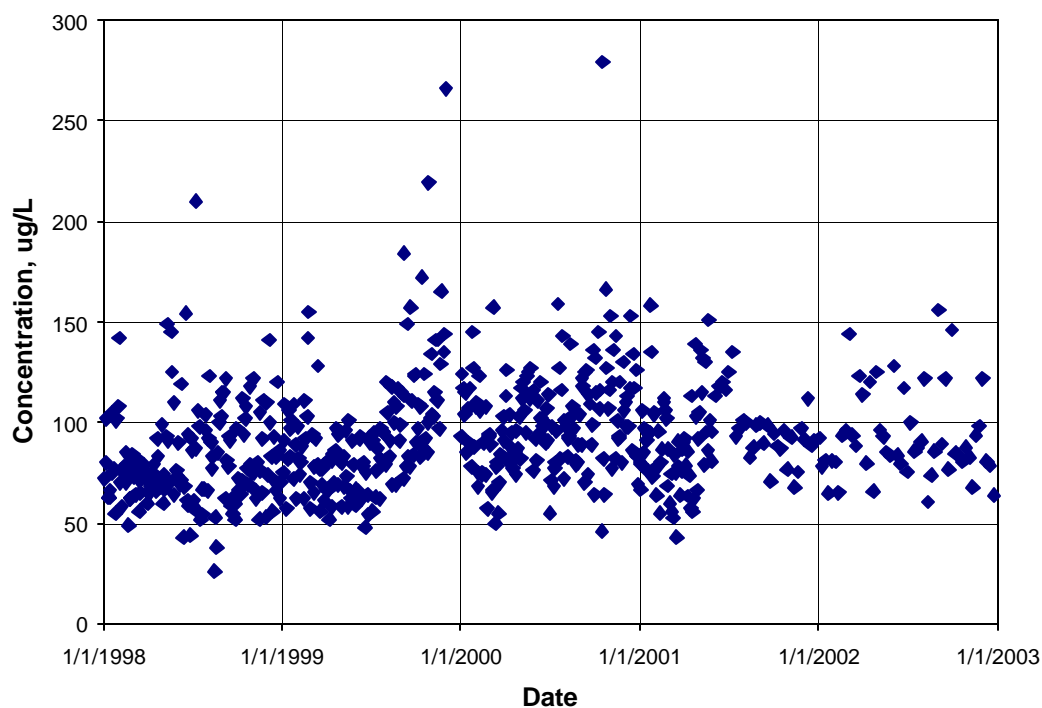


Figure 6: Effluent Copper from the Plant

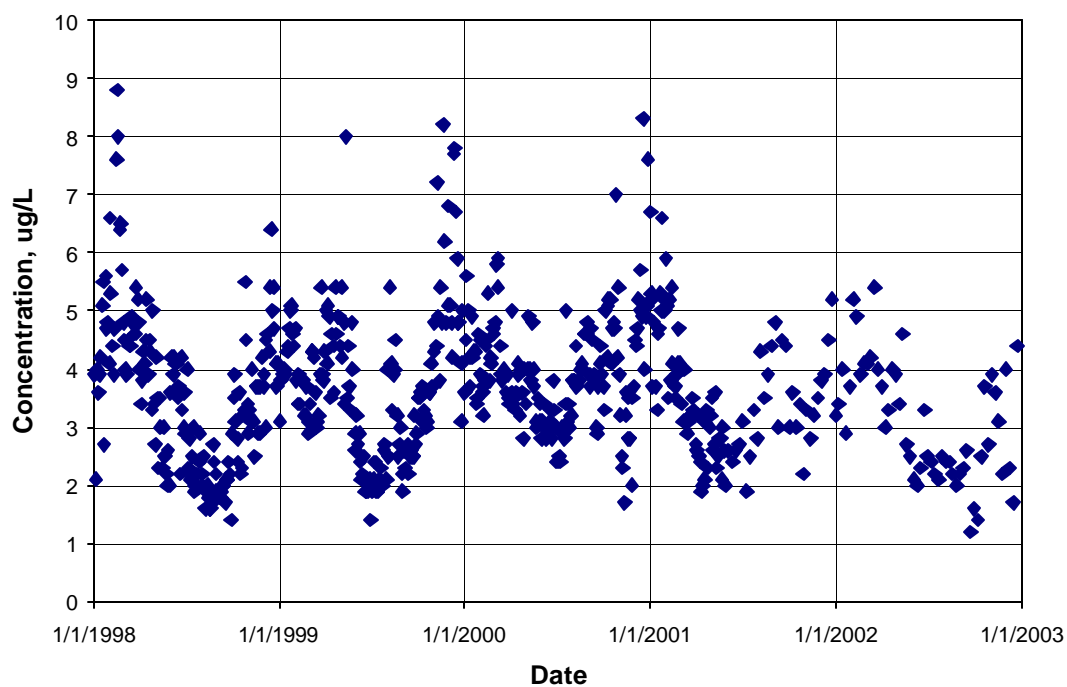


Figure 7: Influent Nickel to the Plant

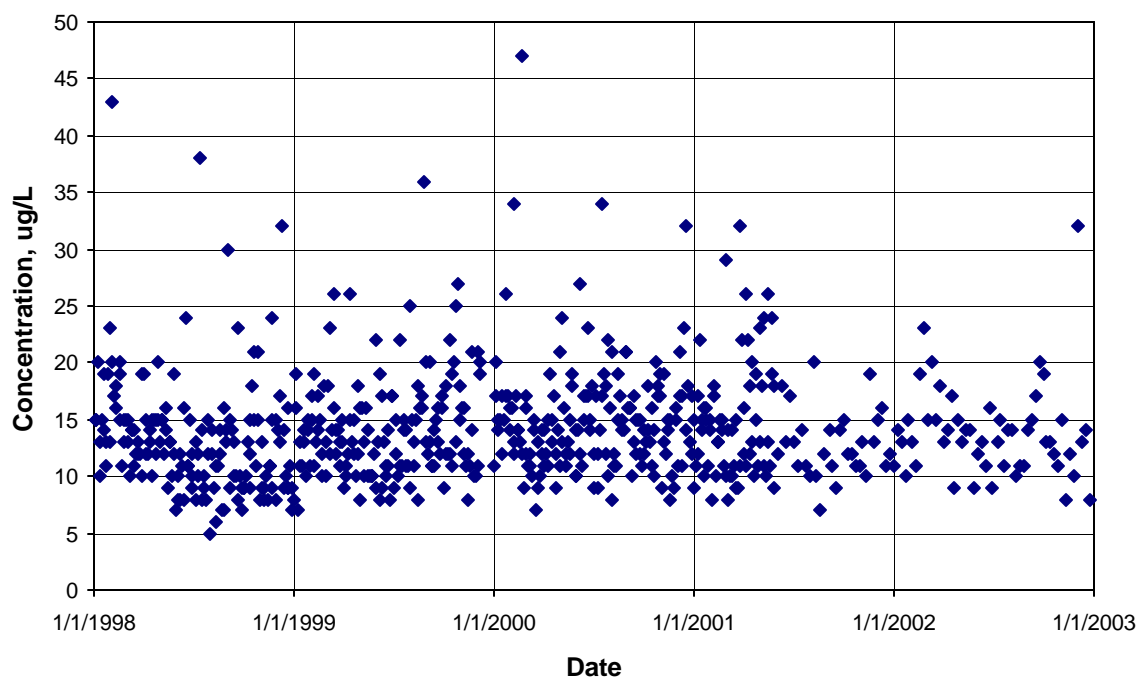


Figure 8: Effluent Nickel from the Plant

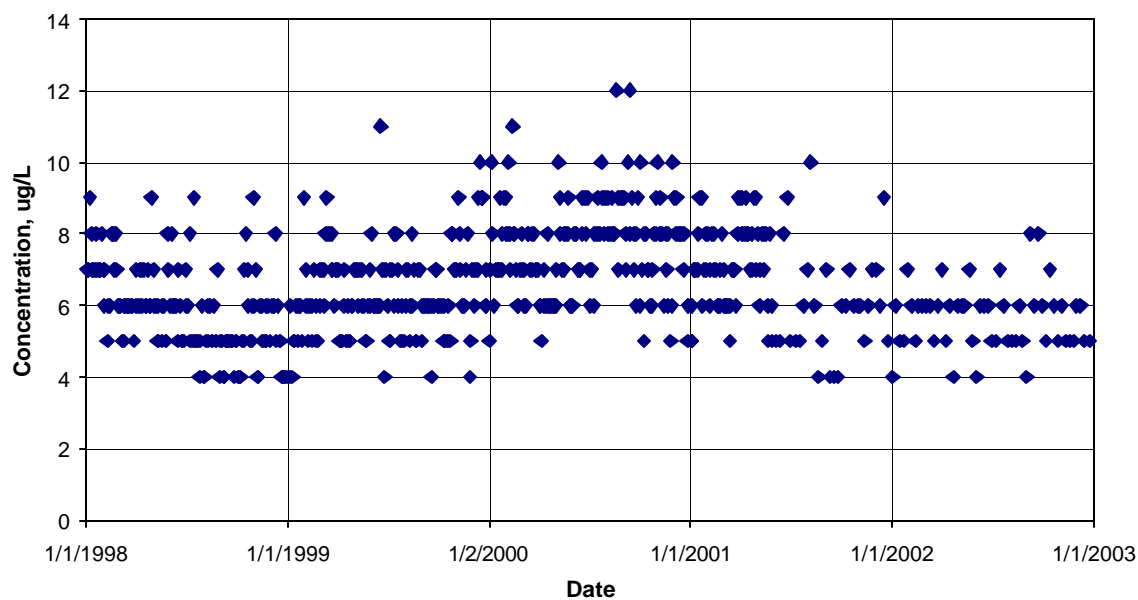


Figure 9: Permitted Dischargers Flow

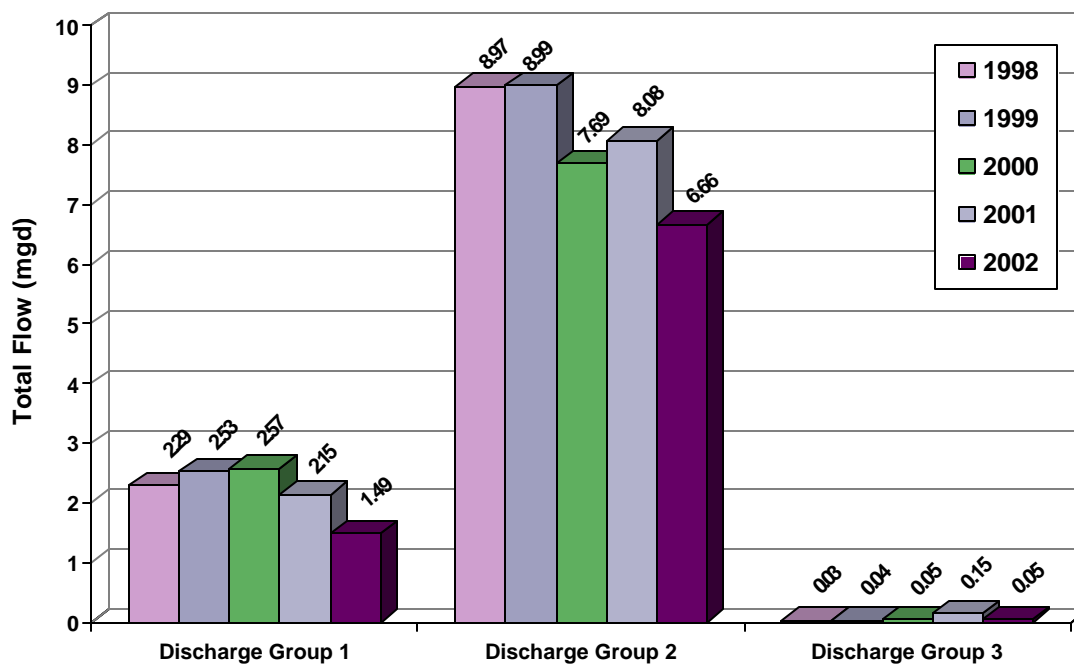
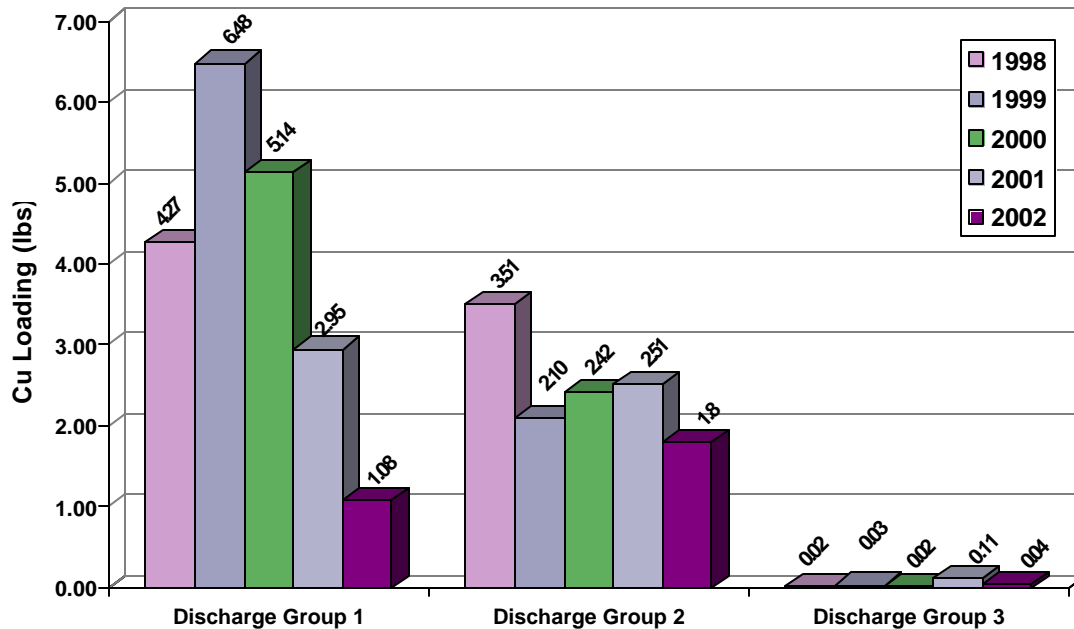
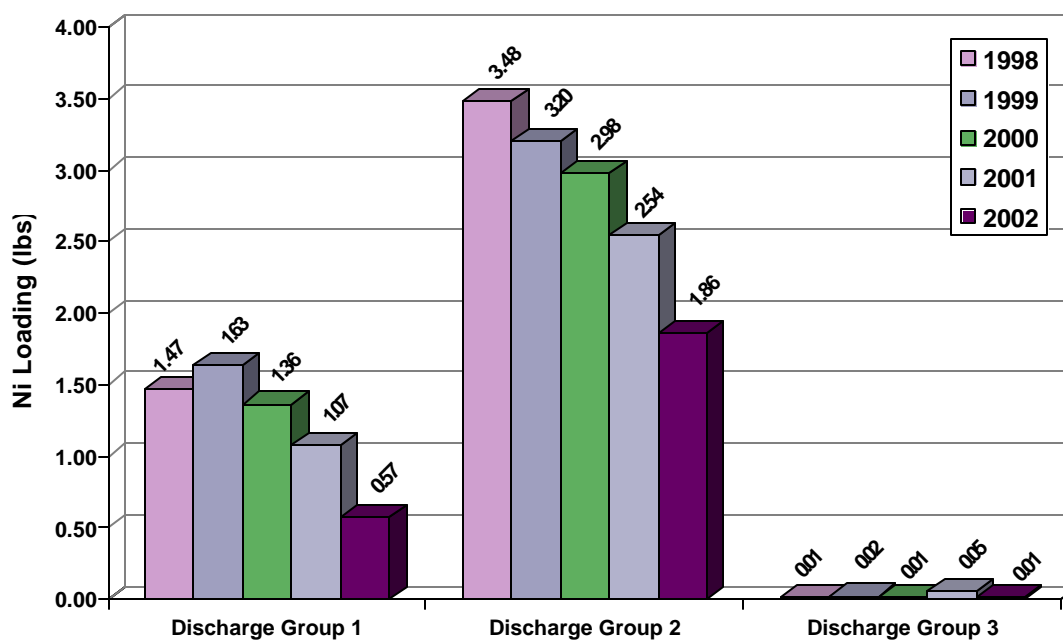
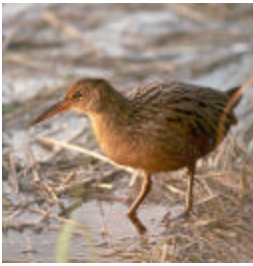


Figure 10: Daily Total Industrial Copper Loading



**Figure 11: Daily Total Industrial Nickel Loading**



## CHAPTER 2

# FLOW REDUCTION AND HABITAT PROTECTION

The Basin Plan prohibits wastewater discharge south of Dumbarton Bridge unless certain exception criteria are met. In an effort to gain exception to the Basin Plan by demonstrating a net environmental benefit, the Plant participated in a five-year Water Quality Monitoring Study conducted by the South Bay Dischargers Authority from 1981 to 1986. Based on that study, the Regional Board determined that water quality enhancement occurs due to localized increase of receiving water dissolved oxygen and the flushing effects of the discharger. The State Water Resources Control Board (State Board) denied the net environmental benefit exception, however, based on the assertion that the Plant discharge converted salt marsh to either fresh or brackish marsh, thereby threatening the habitat of two endangered species, the salt marsh harvest mouse and the California clapper rail.

In 1990, the State Board ordered the City, as the administering agency for the Plant, to implement actions to protect the marsh from conversion by limiting flows to below 120 mgd average dry weather effluent flow<sup>4</sup> or to flows that would not further impact the habitat of the two

endangered species, and to submit a mitigation proposal involving the creation or restoration of 380 acres of salt marsh or equivalent habitat. In 1991, the original Action Plan was proposed by the City to meet these requirements. The Action Plan included water recycling, water conservation (residential and industrial), and marsh mitigation. In October 1993, the Regional Board incorporated the Action Plan into the NPDES permit for the Plant. Despite significant progress in implementing the 1991 Action Plan, Plant discharge averaged 132 mgd in 1996, probably due to the emergence of the Santa Clara Valley from a combination of drought and economic recession. The Regional Board held a public hearing in December 1996 and directed the City to revise its Action Plan. The revised Action Plan was submitted in June 1997, and the Regional Board amended the Plant's NPDES permit to include the revised Action Plan in August 1997. The Plan included the Water Efficiency Program (WEP), South Bay Water Recycling (SBWR), Industrial Water Recycling and Reuse (Industrial), Groundwater Infiltration Reduction (GWI), and Environmental Enhancements.

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<sup>4</sup> The ADWEF is defined in Board Order WQ90-5 as "the lowest average effluent flow for any three consecutive months between the months of May and October".



## GOALS OF HABITAT PROTECTION AND FLOW REDUCTION PROGRAM

- Protect beneficial uses of endangered species habitat of South Bay.
- Provide sound science to understand factors affecting marshes in the South Bay.
- Coordinate with regional wetlands protection and restoration efforts.
- Use an ecosystem approach to address rare and endangered species' habitat in the South Bay.
- Gain a better understanding of the impact of Plant flows on the environment.
- Consider treated effluent as a valuable resource to be managed effectively to the benefit of the community and the environment.
- Comply with Permit requirements cost effectively.

- manufacturing and wholesale;
- retail;
- service industry; and
- other (including government, construction, and utilities)

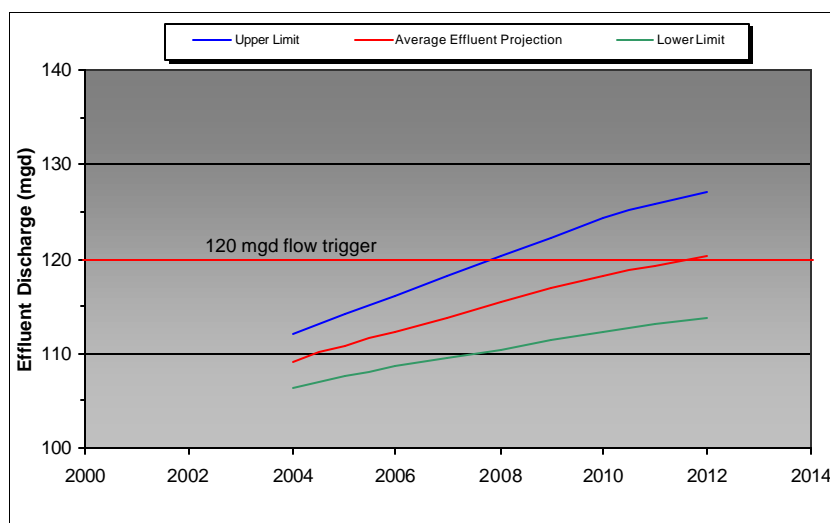
Upper and lower trend lines for dry-weather influent flows were developed in millions of gallons per day (mgd) based on the lowest and highest growth rates for residential and job projections in the Plant's Tributary Area. Total flow reduction due to influent reduction programs (e.g., conservation and groundwater infiltration) and effluent reduction programs (SBWR) were subtracted from these values to forecast flows to the Bay. The model indicates that Plant dry-weather discharges are expected to remain below 120 mgd through the term of the next NPDES permit period (2003 – 2008) under all scenarios, even with robust economic activity and strong housing growth (see Figure 12 below).

## FLOW PREDICTION

A Flow Projection Model was developed to predict the increase in flows that could be expected with varying levels of economic activity and housing growth utilizing demographic data supplied by the Association of Bay Area Governments out to the year 2025. Per capita flow factors<sup>5</sup> were developed and applied to the number of people living and working in the Plant's Tributary Area for the following categories:

- residential;

**Figure 12: Dry-Weather Effluent Projection Envelope**



<sup>5</sup> These values are calibrated using the actual monthly job figures published by the California Employment Development Department (CEDDD).

The model can be used periodically to help determine the need for future programs and their implementation schedules.

## **TIDAL MARSH HABITAT ASSESSMENT**

In 1989, as part of a monitoring program required by the Regional Board, the City commissioned a more detailed study of the marshes potentially affected by the freshwater discharge from the Plant. Subsequent mapping studies were conducted in 1991, 1994, and annually thereafter. These studies document changes in the distribution and extent of salt, brackish and freshwater marsh.

In 1999 and subsequent years, the aerial photographs were processed using digital orthorectification. This state-of-the-art process enhances the accuracy of the mapping by removing distortion, and allows for precise overlaying of other data layers. In addition, the City began collecting physical data in August 1999, including continuous monitoring of tidal elevations and salinity in the tidal channels, as well as porewater salinity, bulk density, and pH of the soil in the root zones of marsh vegetation in the Main Study and Reference Areas. The analysis of this data and of other freshwater input variables aids in determining the relative influences of environmental and anthropogenic factors affecting changes in marsh type.

### **Study Area**

The Main Study Area encompasses 1650 acres of freshwater, brackish, and salt marsh habitats in the Coyote Creek and

adjacent sloughs, while the 255 acre Reference Area represents the tidal zone of the Guadalupe River. For the purposes of data collection and analysis, the study area is divided into 28 segments in four reaches (Upper Reach segments, Transition Reach segments, Lower Reach segments, and Reference Reach) as shown in Figure 13. The Upper (approximately 440 acres), Transition (approximately 390 acres), and Lower Reach (approximately 740 acres) segments, referred to as the Main Study Area, are located within the Coyote Creek watershed and include Segments 1-5 and 8-26. Segments 27-30 are located along the lower Guadalupe River, also known as Alviso Slough. This study assumes that the Plant discharge does not significantly influence the Reference Area, which therefore provides a suitable control site for documenting vegetation changes in South San Francisco Bay.

### **Key Findings**

Brackish marsh plant associations dominated the Upper Reach of the Main Study Area as well as the Reference Area. The Lower and Transition Reach segments are primarily dominated by salt marsh plant species; the Lower Reach has only 16 acres of brackish marsh habitat. Although a similar distribution of habitats is noted in the Reference Area, brackish marsh habitats comprise a much greater proportion of the area than in the Main Study Area (see Figures 18 & 19).

Between 1989 and 1999, the relative change in habitat types through time was less in the Main Study Area than in the Reference Area although the rate of new

marsh formation in the Main Study Area had exceeded that of the Reference Area. This indicates that much of the conversion of salt marsh habitats within the South Bay area was likely driven by large-scale influences (both environmental and anthropogenic) that were affecting the entire system. In 2001 small gains in salt marsh habitat occurred in both the Main Study Area and Reference Area. In 2002 even greater gains in salt marsh habitat were observed. This trend seems to further highlight the influence of multiple factors affecting changes in marsh vegetation communities in South San Francisco Bay.

Although the Plant has had an effect upon portions of the system, discharges from Guadalupe River (Alviso Slough), Coyote Creek and the Sacramento/San Joaquin Delta also play a role in marsh conversion and formation. For example, the Reference Area has experienced a greater rate of salt marsh conversion than the Main Study Area and the Reference Area is hydrologically disconnected from the Plant discharge.

Conversion of brackish marsh habitats to salt marsh habitats occurred in all reaches during the past year including the Upper Reach, the reach closest to the Plant discharge point. In the past thirteen years, there has been only a minimal conversion of salt marsh to brackish marsh habitat (approximately 1 acre) in the Lower Reach segments, and therefore it can be assumed that the influence of the Plant discharge does not extend beyond the Transition Zone of the Main Study Area. Furthermore, the continued decrease in brackish marsh

habitats and concurrent increases in salt marsh habitats since the last El Nino (1997 – 1998) indicates that freshwater discharges and incident rainfall have a dramatic effect on the plant species distribution of the South Bay marshes.

### **New Marsh Formation**

The surface area of marsh habitat has increased by 231.5 acres between 1989 and 2002 within the Main Study Area (Upper, Transition and Lower Reaches Combined). During the same period, 62.9 acres of new marsh has formed in the Reference Area. This equates to a 17% increase in marsh acreage in the Main Study Area and a 37% increase in marsh acreage in the Reference Area between 1989 and 2002.

Marsh area remained relatively stable from 1989 to 1996 in the Main Study Area (see Figure 14). The formation of new marsh habitat in the Main Study Area has occurred primarily between 1996 and 2002 in the Lower Reach and between 1996 and 1998 in the Transition Reach. Gains in marsh area between 1989 and 2002 were greatest in the Lower Reach (nearly 200 acres), while only 30 acres of new marsh formation has occurred in the Transition Reach. The majority of new marsh formation has occurred in the Lower Reach along the north side of Coyote Creek, immediately upstream of Calaveras Point.

### **Salt Marsh**

Figure 16 presents the total acreage of salt marsh habitat by year and location (reach). Salt marsh area decreased in the Transition Reach from 1989 through

2001; the rate of decrease in salt marsh area was greatest between 1989 and 1994. However, a significant increase in salt marsh habitat occurred between 2001 and 2002 in the Transition Reach.

Conversely, salt marsh area increased in the Lower Reach from 1989 through 2002 with most of the increase occurring between 1996 - 1999 and 2001 - 2002. Much of this increase was due to new marsh formation along the north side of Coyote Creek within segments 3 and 4. There has been a significant net change in salt marsh habitat area from 1989 to 2002 (+180.5 acres) within the Main Study Area. For the first time the study has found substantial gains in salt marsh habitat from both new marsh formation (which has been occurring steadily since 1997) and conversion of brackish marsh habitat to salt marsh habitat.

The Reference Reach pattern of salt marsh habitat change remains similar to the pattern in the Transition Reach. The majority of salt marsh decline in the Reference Reach occurred early in the study period between 1991 and 1996, including a slight decline in 2001 with a strong rebound in salt marsh area in 2002.

### **Brackish and Freshwater Marsh**

Figures 15 and 17 present the total acreage of brackish and freshwater marsh habitats by year and location. Relatively minor increases in brackish marsh area occurred in the Main Study Area between 1989 and 2002. The Reference Area has experienced much greater increases in brackish marsh habitat during the same 13 years.

During this period, brackish marsh increased by 28.6 acres (5% increase) and 51.1 acres (55% increase) in the Main Study and Reference Areas, respectively. This is due mostly to marsh conversion (from salt to brackish) in the Reference Area. However, a combination of marsh conversion in the Transition Reach and new brackish marsh formation in the Lower Reach accounts for most of the new brackish marsh in the Main Study Area since 1989. Furthermore, freshwater marsh has increased in the Main Study and Reference Areas during the past 13 years.

The complete marsh assessment reports for the years 1999-2002, *Marsh Plant Associations of South San Francisco Bay: (Year) Comparative Study*, can be found on the Environmental Services Department's (ESD's) web site (<http://www.ci.san-jose.ca.us/esd>) under "Publications and Research."

Figure 13: Tidal Marsh Study Area

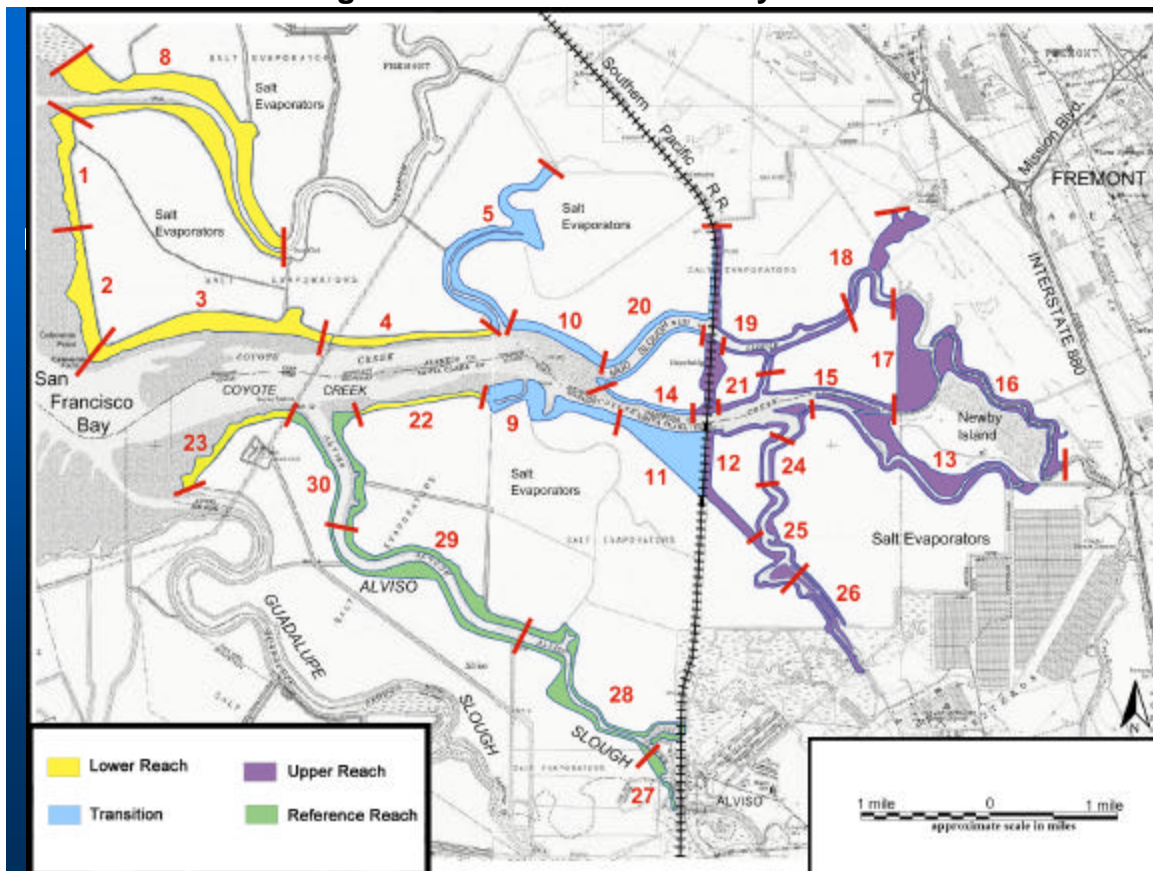


Figure 14: Total Marsh Acreage Comparison

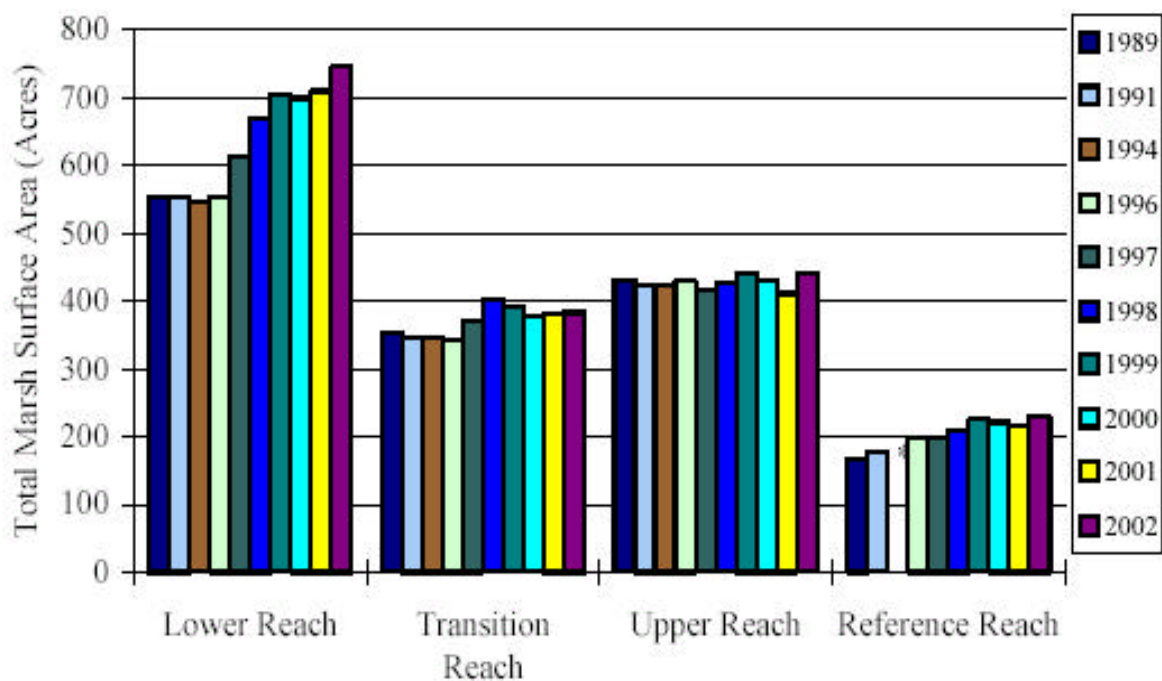


Figure 15: Brackish Marsh Acreage Comparison

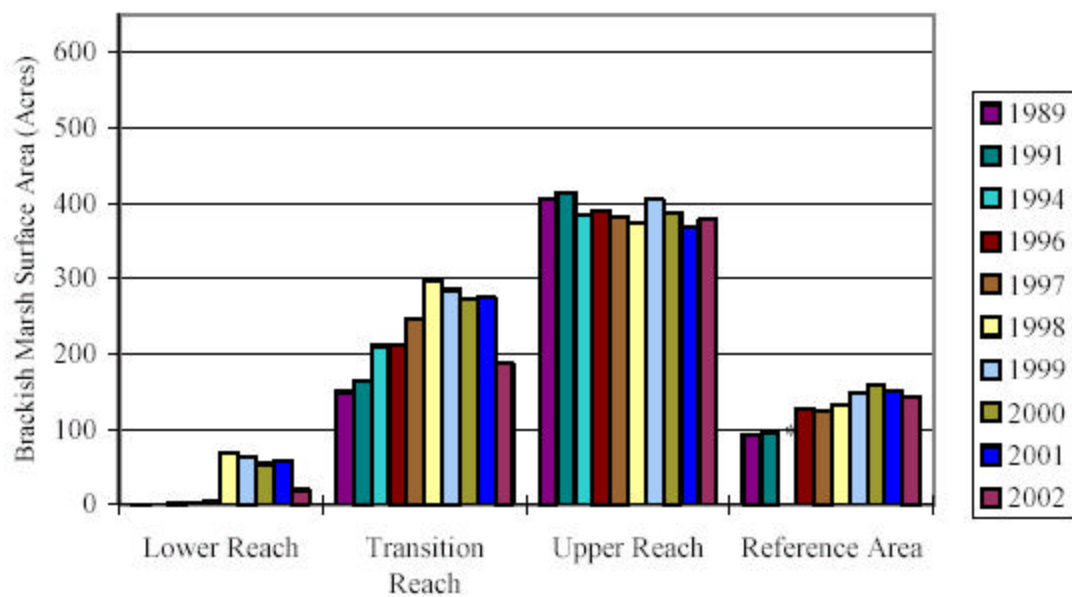


Figure 16: Salt Marsh Acreage Comparison

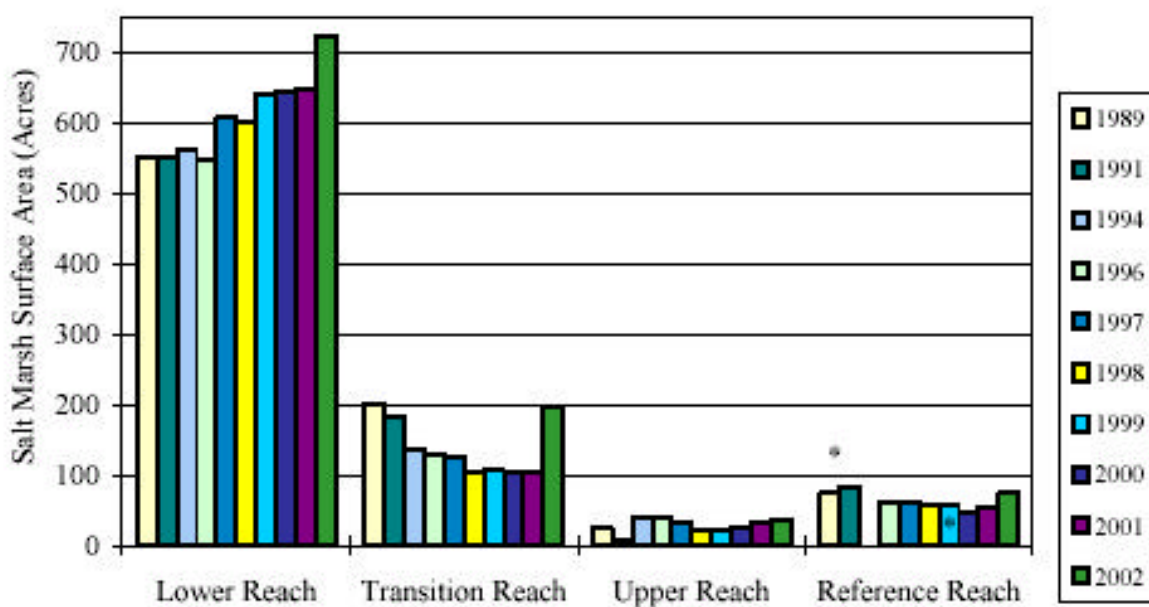


Figure 17: Freshwater Marsh Acreage Comparison

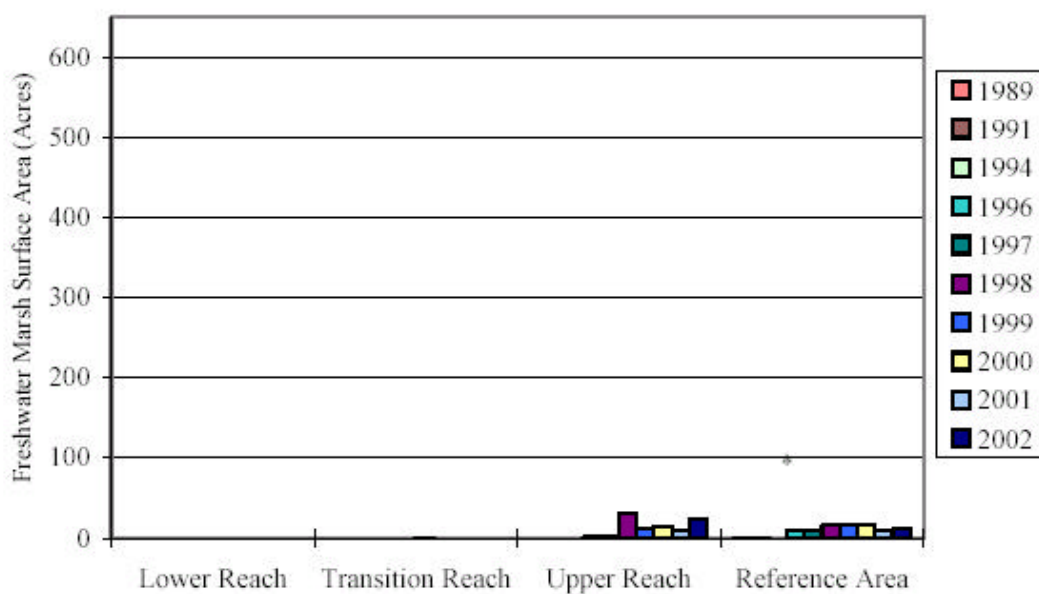


Figure 18: Comparison of the Proportion of Salt Marsh

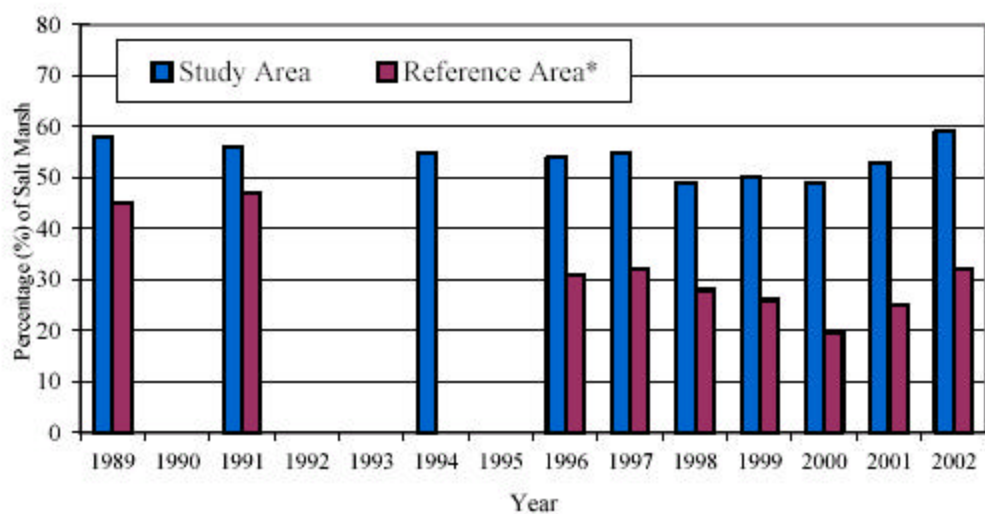
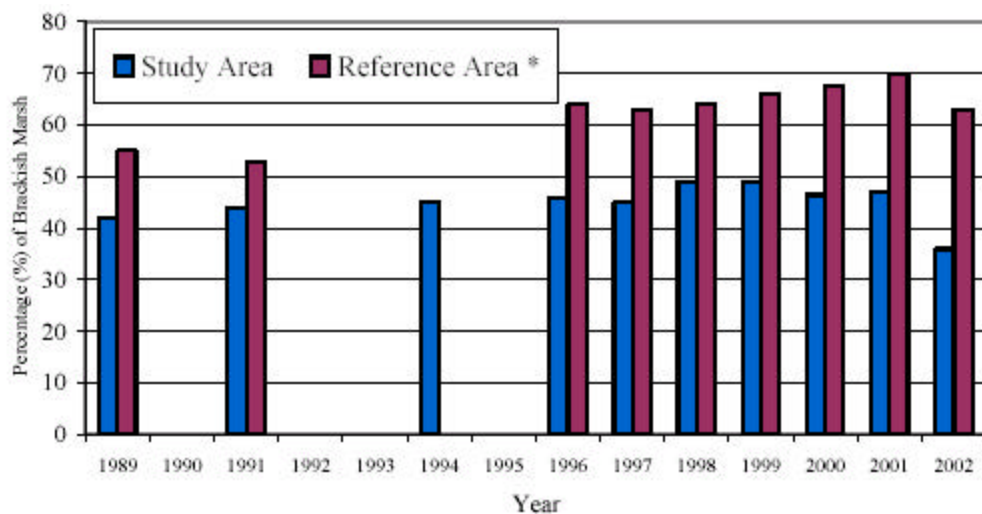


Figure 19: Comparison of the Proportion of Brackish Marsh





## **MARSH MITIGATION**

The City's contribution towards the purchase of the Baumberg Tract, the Moseley Tract, and Bair Island has made it possible for the City to fulfill its marsh mitigation requirements.

### **MOSELEY TRACT**

The City planned to implement a passive tidal restoration to this 54-acre diked seasonal wetland, which historically was used as a duck club by the Moseley family. Site preparation including clearing the site of existing utilities was completed in 1996, and the four old agricultural wells on-site were abandoned in 1997.

A topographic survey and preliminary restoration plan was completed in 1999. This report described the difficulty of continuing to accommodate CalTrans use of the site as a stormwater collection basin while attempting to implement a passive tidal restoration.

The increased cost combined with less mitigation credit (due to additional flood control and stormwater conveyance facilities), have made the site far less attractive as a salt marsh habitat mitigation site for the California clapper rail and salt marsh harvest mouse. The City is currently pursuing legal remedies with the Port of Oakland and CalTrans.

### **BAUMBERG TRACT ("Eden's Landing Ecological Reserve Restoration Project")**

The City contributed funds to the State's purchase and restoration of the Baumberg tract. A consultant contract for the project's Restoration and Management Plan was executed by the

State in April 1997. The project has been permitted and construction begun in 2001. Major construction work is scheduled for completion in the summer of 2003.

### **BAIR ISLAND**

On June 17, 1998 the Regional Board adopted Order No. 98-052 reissuing the NPDES permit for the Plant. Provision 2.2 in the permit required the City to "submit a plan for mitigation of wetland losses caused by the discharge and not covered by previous Orders, including a schedule for implementation acceptable to the Executive Officer." The traditional mitigation approach of purchase and restoration was not feasible due to the limited availability of suitable wetlands habitat in the South Bay. Instead, the City initiated a process to determine the acceptability of alternatives to classic marsh mitigation.

In April 1998, the City transmitted to the Regional Board a proposal to conduct an interest-based approach to address and resolve the marsh conversion issues. In June 1998, the Board approved the submittal of a "Mitigation Alternative Feasibility Report" that would be developed through a series of stakeholder meetings over a six-month period. The feasibility report and accompanying recommendations were accepted by the Executive Officer on December 23, 1998.

The City, in collaboration with Regional Board staff, initiated an open stakeholder process in August 1998, to discuss the viability of four proposed marsh mitigation alternatives. Through this process, stakeholders reached agreement

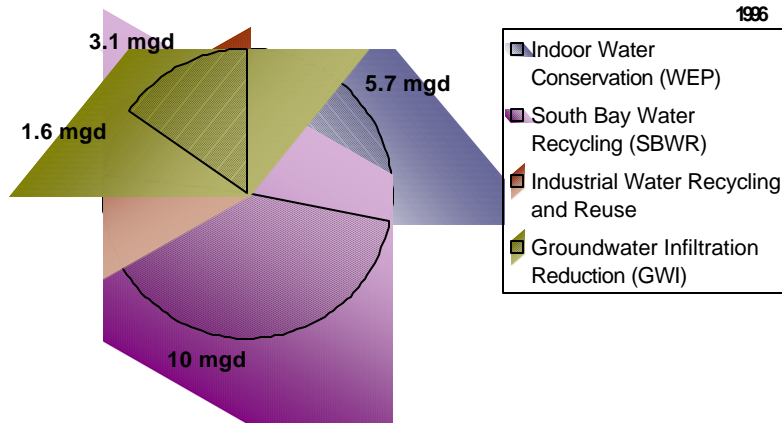
that the purchase and restoration of Bair Island was the highest priority mitigation project in the South Bay.

The Executive Officer of the Regional Board accepted the City's alternative marsh mitigation proposal to contribute \$720,000 for the purchase and restoration of Bair Island, which satisfied marsh mitigation requirements through June 1998. A legal agreement establishing the procedure for acquiring and restoring Bair Island between the City, the California Department of Fish and Game, and the Peninsula Open Space Trust was negotiated and executed in 1998.

### Wetlands Banking

The City purchased a 10-acre salt marsh habitat wetlands bank in 1996 as part of the Eden's Landing Ecological Reserve Project (formerly called the "Baumberg Tract").

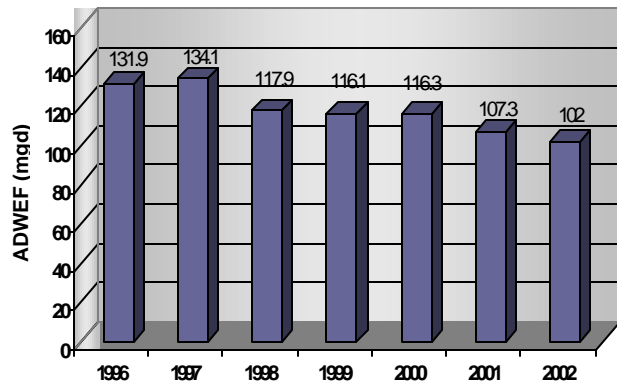
**Figure 20: Action Plan Accomplishments**



### Revised South Bay Action Plan Programs

In 2002, upon the completion of the *Revised South Bay Action Plan (Action Plan)*, the ADWEF from the Plant was 102 mgd. As shown in Figure 21, this marks the fifth consecutive year in which the Plant's flows remained below 120 mgd. The dramatic flow decrease in the last two years indicates that the slowdown in economy has also played a role in addition to the success of flow reduction activities. Reductions from *Action Plan* programs are shown in Figure 20.

**Figure 21: Plant Dry Weather Flows**



**Water Efficiency Program**  
(*COPPER ACTION PLAN Appendix A*  
*Baseline Number 14*)

The Water Efficiency Program (WEP) continued to use the successful indoor water conservation strategies employed prior to the Plan to achieve additional influent reductions of 5.7 mgd. Strategies focused primarily on programs to retrofit older toilets with Ultra Low Flush Toilets (ULFTs). More than 121,000 ULFTs have been installed through this program during the five years of the *Action Plan*. These included free or fee-for-service, full-service installation programs; rebates; and distribution events. The program focused on single-family, low-income, elderly, disabled, and multi-family households as well as commercial settings. In addition, the program either implemented or supported horizontal-axis washing machine rebates, mobile home sub-metering, commercial washer rebates, and other commercial opportunities such as ice machine retrofits. WEP maintained a cost sharing agreement with the District that helped to considerably reduce the cost per mgd of flow reduction. In total, indoor water conservation programs have achieved more than 20 mgd in flow reduction since 1986.

Some additional program activities included:

- A Commercial/Industrial Water Efficiency Workshop was held on November 22, 2002 with Mary Nichols – California Secretary for Resources as the keynote speaker.
- *Slow the Flow* educational campaign.

**South Bay Water Recycling**  
(*COPPER ACTION PLAN Appendix A*  
*Baseline Number 14*)

During the period of the current permit, the South Bay Water Recycling (SBWR) system became operational and has continued to develop infrastructure and promote the use of recycled water for landscape irrigation and industrial uses in San José, Santa Clara, and Milpitas. The recycled water system has grown to include four pump stations, a reservoir, and over 75 miles of pipeline serving over 400 customers. During Summer 2002, the system experienced a peak daily use of 15.2 mgd and a monthly dry weather average of over 10 mgd.

As part of the *Action Plan*, the City Council approved a limited expansion of the recycled water system in June 2001. The estimated cost of the expansion was \$82.5 million. One pipeline extension has been completed in Santa Clara and three others are under construction in Milpitas. This expansion will add nearly 100 customers to the system by the end of 2003.

The SBWR program is currently engaged in a collaborative process with the Water District. This collaborative effort to develop an institutional framework for long-term ownership, operation, maintenance, and future expansion of SBWR has three primary goals:

1. To most effectively meet the long-term water supply and wastewater discharge needs of the community;
2. To ensure that the construction, maintenance, and operation of the Silver Creek pipeline and associated facilities are performed in a manner that protects future water supply and

wastewater discharge needs for Santa Clara County while preserving water quality and protecting the underground aquifer; and

3. To develop a long-term plan, regarding funding and administrative responsibilities, for the operations and maintenance of SBWR.

Recommendations of the committees were taken to a joint meeting of the City Council and the Water District Board on January 21, 2003. The committees' recommendations to study two options for managing recycled water in more detail were approved at the meeting.

#### **Industrial Water Recycling and Reuse (COPPER ACTION PLAN Appendix A Baseline Number 19)**

The focus of Industrial Recycling and Reuse efforts has been to ensure that Industrial Users in the Plant's service area reduce the use of potable water, recycle their own wastewater, and/or use SBWR recycled water to the maximum extent practicable. Programmatic efforts for Industrial Reuse have included technical seminars and financial incentives. Additionally, Flow Audit Studies were completed by the 43 dischargers with the highest wastewater quantity (over 100,000 gpd each). Flow reduction resulting from these efforts totals more than 1.6 mgd over the 5-year term of the *Action Plan*. Overall, industrial flows have decreased dramatically over the same term, from 12.6 mgd in 1997 to 8.2 mgd in 2002. Half of that 4.4 mgd reduction occurred in the last year and can partially be attributed to the economic downturn and business relocation.

The Water Efficient Technologies (WET) program provides rebates to

companies that reduce sanitary sewer discharge by implementing equipment and/or process changes. In the past five years, a total of 35 WET projects have been completed, resulting in flow reduction of over 730,500 gallons/day. Several WET projects resulted from the flow audit studies required of large dischargers as part of the industrial *Action Plan* program.

Some additional activities included:

- Developed *Guidelines for Managing Water in Cooling Systems*.
- Held cooling tower workshops for City staff and industrial dischargers.
- Regular participant at the annual Northern California Plant Engineering & Maintenance Show and Conference.
- Highlighted industrial flow reduction successes in the IU newsletter.
- Produced the first in a series of *Success Stories* describing industrial water reduction projects.

#### **Groundwater Infiltration Reduction**

To reduce extraneous flows into the sanitary sewer system and ultimately through the Plant and into the South Bay, the City and tributary agencies have located and quantified sources of dry weather groundwater infiltration (GWI) into tributary area sewers and have rehabilitated the sewer system as appropriate to reduce GWI.

The GWI reduction program has financed infiltration studies conducted by the City and its tributary agencies and three construction projects. These projects have resulted in a reduction of GWI of approximately 3.1 mgd with

another 1.4 mgd of reductions expected by the end of 2003.

### **Environmental Enhancements**

The Plan proposed two environmental enhancement pilot projects to assess the benefits of releasing recycled water into the Santa Clara Valley watershed. Because using recycled water for habitat enhancement is not well-documented, short-term pilot studies were designed to study freshwater wetlands creation and stream flow augmentation.

A freshwater wetland conceptual plan was developed in 1997 for a site in the San José Airport approach zone. Due to safety concerns raised by the FAA, that site was abandoned and no suitable alternate site for a wetland pilot project was identified.

The purpose of the Streamflow Augmentation Pilot was to study the effects of utilizing recycled water to supplement stream flows in streams with low summer flows and to assess the ability to enhance habitat and improve water quality in streams using recycled water. A multi-year baseline monitoring program in Coyote Creek was implemented. Due to the challenges encountered in implementation, including temperature control costs, facility siting, and permitting, these projects are currently on hold.

### **Program Evaluation**

The *Action Plan* programs have been successful in reducing flows to below the ADWEF trigger of 120 mgd for the last five years. Marsh studies indicate that more salt marsh habitat exists now than in 1989 and that marsh changes are the result of multiple factors.

### **Continuing Activities**

The City will continue its leadership in protecting the habitat of the South Bay, intends to become an active stakeholder in the State/Federal effort to purchase and restore Cargill salt ponds, and will continue implementation of flow reduction programs. These flow reduction programs, including water recycling, conservation, groundwater infiltration reduction, and industrial recycling and reuse as appropriate to ensure that flows remain below the 120 mgd triggers. Discussions with the Water District will continue to explore the long-term feasibility of SBWR expansion in a collaborative effort.



## CHAPTER 3

# MERCURY

On June 17, 1998, the Regional Board reissued the three South Bay discharger NPDES permits which all contain a specific provision for mercury TMDL participation: *“participate with the Regional Board and other South Bay Dischargers in identifying cross media watershed-wide sources of mercury impacting the receiving water and potential control measures,”* as well as *“participate in Regional Board TMDL process development of site specific objectives and/or a wasteload allocation and mass effluent limits for mercury.”* On November 24, 1998 the City submitted for consideration a Mercury Participation Plan that included the following objectives: (1) to continue low level effluent monitoring for mercury and (2) to participate in the Regional Board’s region-wide mercury phased TMDL investigation. The Regional Board accepted the proposal on January 13, 1999.

### Sources

Mercury can be found in wastewater and stormwater. The Guadalupe watershed is the largest source of mercury to the South Bay due to runoff from abandoned mercury mines. Wastewater sources include hospitals and dental offices, however, municipal discharges contribute less than 1 percent of mercury to the South Bay (as discussed in the

Regional Board Mercury TMDL staff presentation, Oct. 2002).

### REGIONAL PARTICIPATION IN SPECIAL STUDIES:

The City, as administrator for the Plant, has participated in the Regional Board’s Mercury Council since its inception in March 1999.

Beginning in 1997, the City committed significant resources toward the Regional Monitoring Program’s Atmospheric Deposition Pilot Study.

This commitment enabled the San Francisco Estuary Project/San Francisco Estuary Institute to receive seed funding from the United States Environmental Protection Agency under the National Atmospheric Deposition Program – Mercury Deposition Network.

Historically, effluent mercury samples at municipal and industrial dischargers in the Bay Area Region were reported as below detection limit, which reduced the accuracy of mercury load estimates from these sources. In January 2000 municipal and industrial dischargers began using ultra-clean sampling methods for mercury, which resulted in a much higher percentage of numerical

results, with individual numerical results typically well below the older detection limits. The City has been using these ultra-clean methods for mercury analysis since March 1996. Effluent monitoring since 1996 has typically averaged 3 ppt total mercury.

In 2002, the City, as a principal member of BACWA, helped conceive and develop the Clean Estuary Partnership (a collaboration between POTWs, urban storm water management agencies, and the RWQCB) to develop TMDLs and implement water quality attainment strategies. The Bay-wide Mercury TMDL will be completed in 2003 as part of the Clean Estuary Partnership.

#### **Pollution Prevention and Source Control Activities**

Regional pollution prevention and source control efforts have focused on dental offices, hospital/medical facilities, and household products. In 1999, the City performed limited sampling at several hospitals and a large dental office to investigate mercury concentrations being discharged from these facilities. The Plant had an average discharge concentration of 3 ppt, well below the 12 ppt discharge limit. Since the concentration of mercury from hospitals was very low, and the dental complex was variable, but low as well, the City determined the best use of resources was to support mercury reduction through regional outreach efforts and best management practices development instead of field inspections and permitting.

The City has been an active member in BAPPG. It provides a forum for

information exchange and regional projects. Its mission is to coordinate all dischargers' pollution prevention activities in order to reduce the amount of toxic pollutants discharged into San Francisco Bay. BAPPG's regional projects cover source identification, source control, and public education. In 2001-02, BAPPG's Dental Amalgam Subcommittee developed an inspection checklist for wastewater inspectors and created a set of PowerPoint presentations for wastewater pre-treatment staff to use to speak with their local dental societies. BAPPG also developed four new mercury pollution prevention ads that aired on Spanish language radio stations. The City is evaluating the best use of the outreach materials for its service area. The City often actively supports pollution prevention legislation such as the California Mercury Reduction Act of 2001 (SB 633).

#### **Future Activities**

At the October 2002 TMDL scoping presentation, Regional Board staff stated that the mercury loading to the bay by municipal dischargers is approximately 1 percent of the total loading to the bay. Because this level is a de minimus contribution, and particularly in the Plant's case where pollution prevention or source control efforts will not significantly reduce the average concentration of mercury to below 3 ppt, the City will continue to focus efforts primarily on participating in regional technical studies and outreach efforts. The City strongly supports a bay area wide solution to this issue.



# CHAPTER 4

## PESTICIDES AND PERSISTENT BIOACCUMULATIVE TOXINS

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### Sources

The Regional Board considers discharges from the Plant as well as stormwater runoff from within the City to be potential sources for pesticides and other organic pollutants such as PCBs, dioxins, diazinon, dieldrin, chlordane, and DDT. Pesticides can enter the Plant through discharge into the sanitary sewer system from washing of spray equipment among other pathways, and the storm sewer system through overuse and use in areas subject to runoff during storm events.

### Activities

Provisions of Order 98-052 for the Plant and Order 01-024 for the Santa Clara Valley Urban Runoff Pollution Prevention Program outline efforts required to implement source investigation and pollution prevention activities. Such activities included:

- The City performed a special study at low detection levels to better quantify the concentration of organic pollutants in the Plant effluent.
- The City has prepared a Pesticide Management Plan for urban runoff.
- The City has also participated in local and regional outreach efforts to educate residential and commercial users of pesticides about practices to

minimize their effect on the South Bay.

### SPECIAL EFFLUENT STUDY FOR CERTAIN ORGANIC POLLUTANTS

On November 24, 1998 the Plant submitted a work plan outlining its proposed special effluent study for certain organic pollutants to comply with Provision E.9 of Regional Board Order 98-052. This study was jointly developed by the three South Bay dischargers (Palo Alto, San Jose/Santa Clara, and Sunnyvale) to conduct low level monitoring with ultra clean procedures and techniques on select organic priority pollutants. The Regional Board staff approved the proposal with modifications on January 13, 1999.

In early 1999, the South Bay dischargers worked with staff from the San Francisco Estuary Institute (SFEI) to further develop and refine a mutually acceptable, monitoring proposal. Three analytical research laboratories agreed to participate in the effluent trace organics study: AXYS Analytical, Texas A&M University, and the University of Utah. Sampling events were scheduled for November 1999, February 2000, April



2000, and July 2000. SFEI assumed responsibility for management of the overall project, contracts, and data as well as final report preparation. A final report was due to the Regional Board by January 31, 2001.

The first two effluent samples for the City were collected in November 1999. Effluent samples from Palo Alto, Fairfield-Suisun Sewer District, and Sunnyvale were also collected in November 1999. The University of Utah and AXYS Environmental Systems (a company specializing in large volume organic extractions and analysis) collected the wastewater samples, while the University of Utah exclusively performed all extractions. After extraction, sample splits were sent to AXYS and the Geochemical and Environmental Research Group at Texas A&M University for analysis.

The Special Effluent Study For Certain Organic Pollutants was completed in March 2001 and was published as the "South Bay/Fairfield-Suisun Trace Organic Effluent Study." The report's primary objectives were to determine concentrations of organic compounds in POTW effluents and assess sources of variation related to the collection and measurement of organic pollutants using ultra-sensitive techniques. The technical report is available for downloading at the San Francisco Estuary Institute's web-site at <http://www.sfei.org>.

The study provided higher quality estimates for method detection limits of trace organic compounds using advanced ultra-trace sampling and analysis techniques. These techniques were found to yield a reduction in Method Detection

Limits by as much as two orders of magnitude or better than that which is available from commercial laboratories. Since the detection of many regulated organic compounds is limited by available technology, developing improved sampling techniques will provide a better understanding of these contaminants and their relative loading impacts to the Bay. The report emphasized the importance of internal and external checks as well as historical and professional scientific judgment as a key component in assuring quality when measuring pollutants at these minute levels.

## **URBAN RUNOFF PESTICIDE MANAGEMENT**

The City submitted its Pesticide Management Plan (PMP), in the March 2002 Urban Runoff Management Plan, to the Regional Board. A City-wide Pesticide Management Committee (PMC) was formed and includes representatives from the following Departments: Environmental Services, Transportation, General Services, Public Works, and Parks, Recreation and Neighborhood Services. The PMC has written drafts of an Integrated Pest Management (IPM) policy, Standard Operating Procedures and Best Management Practices for pest control/pesticide application on municipal property.

## **PESTICIDES OUTREACH**

Urban residential and non-regulated commercial sources of pesticides are addressed through public education

programs advocating voluntary behavior changes. Non-urban upper-watershed sources of pesticides are regulated through other means. Urban wastewater sources for pesticides include cleanup after use of household insecticides, improper disposal of unused pesticides, mixing, cleanup after pesticide use, and use of strong pesticides where less toxic methods are effective. In addition to the above named sources, stormwater sources include improper application (e.g. just before a rain), and over-application. Over the last 5 years, the City addressed sources of pesticides from wastewater and stormwater sources through pesticide reduction outreach to local and Bay Area wide English, Hispanic, and Vietnamese audiences. Implementation took place through participation in BAPPG, Bay Area Stormwater Management Agencies Association (BASMAA), the Regional Media Relations workgroup, Watershed Management Initiative, and the Santa Clara Valley Urban Runoff Pollution Prevention Program (Urban Runoff Program).

The City participated in the development and production of new local and regional materials, and updates of existing materials designed to reduce pesticides from residential, commercial and industrial sources. The City distributed a variety of brochures and fact sheets promoting pesticide pollution prevention in Spanish, English, and Vietnamese. (materials listed below). The City also evaluated its own pesticide use at the Treatment plant and, as a result of that evaluation, changed products.

### **Integrated Pest Management**

One approach promoted at the regional level was an IPM approach to pest management. IPM stresses the use of a combination of tactics designed to reduce the need for direct intervention using pesticides. Fact sheets promoting less-toxic alternatives to pesticide use were developed by the *Our Water Our World* partnership (IPM project). The IPM project places literature in over 100 bay Area hardware stores each spring, including several Santa Clara County stores. The City supported the IPM committee activity from both the wastewater and the stormwater sides through contributions and participation in both BAPPG and the Urban Runoff Program. The City also produced the first of these IPM fact sheets to be translated into Spanish, and shared that translation with the IPM workgroup at no cost. Currently, four more of the fact sheets are being translated.

### **Media Relations**

Through the Regional Media Relations workgroup, the City produced prewritten articles and press releases that resulted in articles in newspapers all over the Bay Area. The Media Relations workgroup also conducted press briefings, developed and distributed a media guide explaining water pollution issues and listing contacts for further information, developed a media contact list and provided professional training for those contacts. Media Relations preparations led to on-air interviews on several subjects including pesticide use.

### Watershed Watch Campaign

The City also participated in the collaboration between the WMI and the Urban Runoff Program to implement the Watershed Watch Campaign. The campaign delivers watershed and water pollution prevention messages to residents, schools, and businesses in the Santa Clara Basin. Partnership agreements, donations, and in-kind services have increased the value of the campaign to an estimated \$1.2 million.

Industrial facilities learned about sources of pesticides from manufacturing processes through articles in the City's newsletter for Industrial Users, *The Tributary Tribune*. Through BAPPG, two training workshops were held to train Pest Control Operators in sales techniques for less toxic pest control methods. A partnership between BAPPG and the Urban Runoff Program resulted in a third training event in Santa Clara County.

The City developed the award winning "Wastewater Paths" poster to assist residents, businesses, educators and school aged children to understand how pollutants like pesticides get from their homes and businesses to the Bay and made the poster available Bay Area-wide through BAPPG. Currently, the City continues to support the IPM project through BAPPG and the Urban Runoff Program, the Watershed Watch campaign, and delivery of pesticide messages through the Media Relations workgroup. The City will continue to support cost effective tactics to keep pesticides out of our Creeks and Bay.

### Pesticide Related materials and Projects

- Watershed Watch Campaign – Urban Runoff Program/WMI
- When Ants Invade radio and TV campaign – BASMAA Regional Ad Campaign
- Half hour Spanish radio interview and pesticide commercials during Spanish radio ad campaign– BAPPG (project managed by the City)
- Articles, television interviews, media education, spokespersons – Media Relations workgroup
- *The Bay Begins at your Front Door* – BASMAA
- *Home Maintenance Tips for a Cleaner Bay* - Urban Runoff Program
- "IPM" fact Sheets – BASMAA/BAPPG
- Pests Bugging You (English, Spanish, and Vietnamese) - printed through the Urban Runoff Program
- Spanish Translation of "Ants" IPM Fact sheet –The City
- Grow-It guide (less toxic garden pest control) - printed through the Urban Runoff Program



## **CHAPTER 5**

# **RELATED WATERSHED BASED ACTIVITIES**

In addition to the priority pollutant-specific programs, the City implements programs to address other pollutants, increase stakeholder involvement, and conduct studies.

### **THE PRETREATMENT PROGRAM**

In a letter dated May 16, 2002, the City submitted an updated Enforcement Response Plan (ERP) to the Regional Board for comment. The revised ERP was updated to clarify enforcement issues related to duration and magnitude of the violation. Regional Board staff completed their review of the ERP and returned their comments on December 15, 2002. A meeting with Regional Board staff was scheduled for January 14, 2003 to go over their comments.

Additionally, work was completed on an extensive set of procedures for the Environmental Inspectors to follow in order to consistently implement the City's Pretreatment Program. These procedures are now in place and training for these procedures was conducted for staff on November 13, 2002.

As a result of a Pretreatment Compliance Audit conducted by the Regional Board in May and June of this year, the program was required to conduct a legal

authority review. This review is designed to see that all required elements of the pretreatment program are represented in the City's Municipal Code and the Codes of the other Tributary Agencies. The review was completed in December 2002.

### **DEVELOPMENT PLAN REVIEW**

The Development Action Review Group provides written comments to the City's Department of Planning, Building, and Code Enforcement (PBCE), the division responsible for administering the review and approval of development in the City. This review of proposed developments is frequently ESD's first opportunity to inform developers of discharge and service requirements that should be addressed in the design phase. Some of the design considerations include wastewater discharge reduction, pollutant minimization, onsite reuse and use of recycled water. This is also an opportunity to inform the developer of other non-required conservation measures such as electronic faucets and water efficient laundries and washing machines.

### Activities

ESD developed standard language for comments to specific planning issues. ESD is beginning to implement a web-based development review process and tracking system. The number of reviews of each type are shown for the last six months and the last five years in Tables 1 and 2, respectively.

**Table 1**

**Activity Summary – July 1, 2002 – December 31, 2002**

Number of development applications reviewed for the following subjects:	
Recycled Water	30
Water Efficiency	16
Source Control	26
Number of Environmental Impact Reports (EIRs) reviewed	
	5

In addition, several strategic planning meetings were held between the Green Building Policy coordinator and the PBCE to discuss implementation of the recent Green Building Policy that went into effect on July 1, 2002. Several training sessions were completed in late 2002 to educate PBCE management, planners, architects and others in the Green Building Leadership in Energy & Environmental Design certification process. Based upon the newness and complexity of Green Building issues, PBCE will work directly with the Green Building Policy coordinator and keep comments separate from the weekly new development process.

**Table 2**

**Activity Summary – January 1, 1998 – December 31, 2002**

Number of development applications reviewed for the following subjects:	
Recycled Water	476
Water Efficiency	269
Source Control	411
Number of Environmental Impact Reports (EIRs) reviewed	
	41

## CITY OF SAN JOSE BIOASSESSMENT PROGRAM

### *(COPPER ACTION PLAN Appendix A Baseline Number 17)*

The Plant's NPDES Permit Order No 98-052 - Provision E.4 contains requirements to conduct bioassessment/biocriteria studies to develop additional tools and measurements for characterizing the water and sediment quality in the lower South Bay. The fundamental purpose of these investigations is to cooperatively develop, with the assistance of the academic and regulatory communities, bioassessment techniques that could possibly lead to site-specific environmental indicators for the South Bay.

### Five Year Summary

In December 1999, the City submitted to the Regional Board a proposed Bioassessment Study Plan consistent with the intent of Provision E.4. The Study Plan was approved by the Regional Board's Executive Officer in January 2000.

In February 2000, the City formally requested a time extension for conducting the approved studies following notification from Regional Board staff of changes to the RMP that

could severely limit the effectiveness of the proposed investigations. The time extension was approved by the Regional Board's Executive Officer in February 2000.

In early 2000, the City met and discussed bioassessment study prospects with Regional Board staff and local scientific experts. Following these discussions, the City worked with scientists from San Francisco State University's Romberg Tiburon Center for Environmental Studies to produce a study plan to develop bioassessment techniques for San Francisco Bay's plankton community. The Regional Board formally approved the City's plankton bioassessment study in November 2000.

The approved plankton bioassessment study will develop and conduct a pilot monitoring program of the plankton of the South San Francisco Bay to provide guidelines for long-term monitoring, and recommendations of indicators of ecosystem condition. This plankton bioassessment study is to occur over a four-year period at an approximate cost of \$506,000. This project has two phases: an initial phase (~ 2 yrs) in which existing data are used to develop a monitoring plan, including potential indicators of ecosystem condition, and to conduct preliminary monitoring; and a second phase (~ 2 yrs.) of field work to test and further refine the monitoring plan and proposed indicators.

In November 2002, due to delays in contractual arrangements, the City requested from the Regional Board a six-month time extension for deliverables

associated with this study, with the final report on Phase I due to the Regional Board in June 2003 and a Phase II final report due in June 2005.

Deliverables received since the execution of the contract (June 20, 2001) include five quarterly cruise reports and two semi-annual progress reports.

The Technical Advisory Group (TAG) was organized to provide program direction and technical review and to better facilitate interagency coordination in designing and conducting field work and analysis. Stakeholder groups represented on the advisory committee include the United States Geological Survey, Interagency Ecological Program, Environmental Protection Agency, San Francisco Estuary Institute, Regional Monitoring Program, San Francisco Regional Water Quality Control Board, San Francisco State University, and the City. The next TAG meeting is scheduled to occur in April 2003, following production of the Phase I draft report.

The acquisition of historical data nears completion. This data is being used in a thorough quantitative analysis of plankton community composition and abundance, and possible covariance with water quality conditions.

The Phase I draft report is in production. Results from analysis of the historical data are being used to develop a long-term monitoring plan, including potential indicators of ecosystem condition. The Phase I draft report, which includes the long-term monitoring plan to be tested and refined during Phase II, is due in April 2003.

In addition to the plankton study described above, the City proactively supported an investigative effort to develop alternative assessment methodology and techniques to define the “health” of the estuary. A report entitled “Evaluating the Ecological Condition of the South Bay: A Potential Assessment Approach,” was prepared by the Center for Ecosystem Management and Restoration to satisfy these goals. The City’s fundamental objective in sponsoring this technical compilation was to generate debate and discussion on potential future activities in this arena. The final report was sent to the Regional Board’s Executive Officer in August 2002.

## **WATERSHED MANAGEMENT INITIATIVE**

The Santa Clara Basin Watershed Management Initiative (WMI) was established in 1996 by the U.S. EPA, the State Water Resources Control Board, and the Regional Board as a broad community-based stakeholder process focused on protecting and enhancing the Watershed. The City is an active participant and has devoted significant resources to this effort, chairing the Core Group and several subcommittees for several years. The WMI’s key accomplishments this year include:

### **Strengthening the WMI as a Stakeholder Process**

- 1) Recognition from the State Resources Agency as one of the ten best watershed programs in the state in February 2002 at a half day celebration with the WMI stakeholders and local, regional, and state dignitaries.
- 2) Addition of Santa Clara County Open Space Authority to the list of 33 signatories.
- 3) Invited to speak at three regional conferences, the County’s “Riparian Renaissance”, the International Landscape Architects National Conference, and the Environmental Justice Coalition for Water’s Workshop on impaired water bodies and the total maximum daily load process.
- 4) Presented four papers at the Biennial National Watershed Management Council Conference in Washington, topics include “Watershed Action Plan”, “Stream Stewardship”, “Watershed Assessment”, and “Watershed Governance.”

### **Contributing to Permit Streamlining Related Activities and Programs**

- 1) Adoption of Copper/Nickel Basin Plan amendment and site specific objectives for South San Francisco Bay.
- 2) Provided the stakeholder forum for the District’s multi-year Stream Maintenance permits from all permitting and resources agencies.
- 3) Initiation of the Permit Work Group for re-issuance of three South Bay wastewater treatment plant permits.

### Providing Stakeholder Forum for Key Issues or Planning Efforts

- 1) Development of the Coyote Stream Stewardship Plan.
- 2) Effective stakeholder dialogue, research and fact sheets on endocrine disrupting compounds.
- 3) Production of three white papers related to land use: *“The Role of Stormwater Programs in Regional Congestion Management Planning and Implementation”*, *“Economic and Tax Incentives in Watershed Management”* and *“Municipal Development Policies Comparison.”*

### Making Progress for WMI Work Products

- 1) Completion of the Draft Watershed Action Plan.
- 2) Completed pilot Watershed Assessment process and produced report including “lessons learned.”

The Initiative’s planning phase focused on three primary products, the *Watershed Characteristics Report*, the *Watershed Assessment Report* and the *Watershed Action Plan*. The *Characteristics Report* was published in May 2000. The *Assessment Report* is currently undergoing final review and a draft *Action Plan* is scheduled to be completed by March 2003.

The *Watershed Action Plan* outlines a comprehensive strategy for adaptive management of Basin watersheds and sets the stage for more detailed planning at the watershed scale. The Plan includes nine strategic policy objectives, which specify desired outcomes to be

achieved by aligning, coordinating, and integrating existing policies and programs. The nine strategic policy objectives, which are areas to focus action, are:

1. Stream Stewardship Planning
2. Integrated Planning of Floodplains and Riparian Corridors
3. Habitat Conservation Plans/Natural Community Conservation Plans
4. Expanding the Don Edwards San Francisco Bay National Wildlife Refuge
5. Incorporating the WMI Vision into General Plans & Specific Area Plans
6. Promote Drainage Systems that Detain or Retain Runoff
7. Better Assessments, TMDLs, and Discharge Permits
8. Integrated Water Resources Planning
9. Watershed Education and Outreach

The Core Group, which is the policy-making body of the WMI, used a preliminary prioritization exercise to identify workplan elements for the next year. This prioritization showed that continuation of the Initiative to coordinate and build alliances is one of its most important functions. Work elements identified included outreach and education, particularly on the Action Plan document and continuation of a collaborative permit process. The Action Plan effort has been coordinated with the Regulatory Executive Forum, a group of high level executives of participating regulatory agencies, municipal Department directors, the Water District and WMI chair.

The Core Group is now in the process of developing a workplan for 2003. Once



the Action Plan document is finalized, Initiative members will seek endorsement of the Action Plan and the Initiative process from member agencies. Member agencies, including the City and District, are being asked to accept the nine key policy objectives of the Action Plan and pledge to continue working together in the implementation phase of the Initiative.

## **OUTREACH EFFORTS**

The City participates in regional groups that deliver common messages to the public and to schools.

### **Watershed Watch Survey**

In November of 2002, the City's contractor presented the results of the Watershed portion of the trilingual survey (Watershed Watch Survey) to WMI and Urban Runoff Program participants. The City completed the Survey in February of 2002. The survey was designed to provide an early baseline to guide the Watershed Watch campaign for the WMI and Urban Runoff Program. Discussions of how Watershed Watch Survey findings and recommendations can be used to improve Watershed Watch campaign implementation in FY 02/03 and FY 03/04 are under way.

### **Media Relations Project**

The City participated in the Media Relations Committee to develop their annual workplan, press releases, and text for Public Service Announcements. Several Bay Area newspapers wrote articles based on the TMDL press

releases on less-toxic pest control. Pitches to Bay Area media led to three on-air television interviews.

The City contributes to the Media Relations project through BACWA and BASMAA. The value of the media coverage obtained increased by an estimated 23% this year.

### **New Regional Outreach Activity**

One element of Clean Estuary Partnership (CEP) implementation is regional outreach, and determining the scope of CEP outreach. At the request of BACWA, City staff attends the CEP Outreach meetings with the goal of coordinating CEP outreach activity with the existing regional outreach activity of BACWA, BAPPG, and BASMAA.

### **Pollution Prevention Menus**

During BAPPG's FY 02/03 project proposal process, Regional Board staff proposed that BAPPG consider a project to produce pollution prevention (P2) "menus" i.e. lists of projects that POTW's could choose from when formulating P2 strategies. Regional Board staff indicated their intention to require P2 plans from Bay Area dischargers through permit requirements, and as part of responses to SB 709 violations. After discussion at BACWA and BAPPG, the project was proposed, and is now a part of the 02/03 workplans for BAPPG and BACWA's Permit Committee. BACWA's Permit Committee will take lead on the project.

### **Continuing Regional Outreach Activities**

The City continued their active participation on the outreach committees of the WE&O, BACWA, BAPPG, the Urban Runoff Program, the WMI, and BASMAA. The actions below highlight some of the activities not mentioned in previous sections. City staff:

- Managed BAPPG's Spanish radio ad campaign, and aired a total of seven radio spots over an eight week period beginning in September of 2002 on radio station KSOL.
- Facilitated the BAPPG annual pollutant and issue prioritization process,
- Coordinated administrative changes that resulted from making BAPPG a committee of BACWA

### **WATERSHED GRANTS**

In order to be responsive to the need for stakeholder input and support for watershed efforts, San José's City Council approved the initiation of a pilot Watershed Grants Program. The goals of the Watershed Grants Program are to:

- Foster and implement innovative solutions to local watershed problems
- Encourage partnerships and joint ventures
- Acquire new participants and challenge existing participants
- Increase awareness of watershed issues
- Leverage resources.

Two cycles of grants were awarded during the 1998/1999 and 2000/2001

fiscal years. A total of 36 grants were awarded, totaling over \$600,000. Groups awarded grants committed an additional \$170,000 in matching funds.

The Watershed Grants Program has met the goals that were set for this effort. The City's watershed protection efforts were improved by this program in the following ways:

- An increase in collaborative partnerships that leverage resources for protection and restoration activities
- An increase in stakeholder participation and involvement in watershed activities
- A greater understanding by those involved in managing and protecting ecosystems of key stakeholder issues, and of ecosystem functions and processes
- An increased awareness by the community of the fragile nature of the South San Francisco Bay and the opportunities for involvement and improvement

Partnerships and stakeholders are necessary for the success of the Watershed Management Initiative. It is also important that we continue to work with educators and students to inform them of the key issues and concerns related to our watershed.

With this in mind, the Watershed Grants Program was extended by the San José City Council at their June 25, 2002 meeting for the purpose of continuing to meet its adopted goals. A request for proposals for the Cycle Three Watershed Grant Program was released on July 15, 2002 with submittals due August 30,

2002. This program is reviewed on an annual basis and decisions to implement this program in the future depend on fund availability and documentation that objectives are being met cost effectively.

Three operating grant awards were made to organizations to ensure their participation in the Watershed Management Initiative. Two program grants were awarded. Those programs will concentrate on:

- 1) mapping causes of avian botulism in the Santa Clara Basin watershed; and
- 2) support of the Children Museum's *BioSITE* environmental education program serving 1,000 elementary, middle and high school students. The Youth Watershed Education Grant Program also continues as a part of this program.

### **AVIAN BOTULISM**

The Plant monitored in Artesian Slough, Coyote Creek and Alviso Slough for the presence of avian botulism. The study areas include tidal areas with fresh and brackish water. There were a total of 52 surveys by boat, car and by foot for the period of June to November 2002. There was no evidence of avian botulism in 2002.

Outbreaks of avian botulism cannot be predicted with existing data. No correlation between Plant changes in operation and outbreaks of avian botulism has been shown. The City will continue to collect information on avian botulism in the study areas. The City is participating in an effort to create a regional GIS view of the entire South Bay to track avian botulism outbreaks. The development of a regional database will allow for better temporal and spatial analysis of this issue and might assist in creating a better understanding of avian botulism in the South Bay and its causes.



## **APPENDIX A**

### **CLEAN BAY STRATEGY TIMELINE**